WATER AND SEWER UTILITY ORGANIZATION AND FINANCING IN THE BALTIMORE REGION

APRIL 1966

STONE & WEBSTER SERVICE CORPORATION

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PREFACE

The 1963 Session of the General Assembly of Maryland passed Joint Resolution 61 which requested the appointment of a commission representing Baltimore City and Anne Arundel, Baltimore, Carroll, Harford and Howard Counties to study and report on existing mutual problems relating to the water, sewerage and sanitary services in the Baltimore metropolitan district.

On May 1, 1964, at the suggestion of Governor J. Millard Tawes, the Regional Planning Council appointed from within the Baltimore Region a fourteen member body, later designated the Water and Sewer Special Advisory Committee. The following persons were appointed to the committee:

Anne Arundel County	Edward S. Corcoran, Chairman
	Joseph F. Collinson, Jr. 1/
	William A. Hasfurther
Baltimore City	Charles L. Benton
	B. H. Griswold, III
	Mrs. Janet L. Hoffman
	Bernard L. Werner
	Dr. Abel Wolman
Baltimore County	Jervis S. Finney
	Francis N. Iglehart, Jr. 2/
	Albert B. Kaltenbach
Carroll County	George A. Grier
Harford County	Wilson A. Heaps
Howard County	David W. Force

This committee engaged the Stone & Webster Service Corporation to conduct the managerial and fiscal phases of the study and met with and assisted this consultant periodically throughout the course of this study. We would particularly like to express appreciation for this assistance. Final responsibility for the report and its contents, of course, rests with the consultant.

1/ Mr. Joseph W. Alton, Jr., succeeded Mr. Collinson

2/ Mr. Carville Akehurst succeeded Mr. Iglehart

STONE & WEBSTER SERVICE CORPORATION
90 BROAD STREET
NEW YORK, NEW YORK 10004
BOWLING GREEN 9-4224

April 19, 1966

Water and Sewer Advisory Committee of the
Regional Planning Council

Gentlemen:

We submit herewith our revised report on the financial and organizational aspects of the Region's water and sewer utilities.

We believe that this report covers the rather complex subject matter sufficiently well to be of some value to the Region. Its size is rather formidable, and some material of a rather specialized nature has been included, which may not be of particular interest to each reader. If additional comment or explanation is desired, please feel free to call us.

We are pleased to have been given this assignment and wish to offer our thanks to the many people in the Region who patiently and courteously helped us in furthering the report.

Respectfully submitted,

STONE & WEBSTER SERVICE CORPORATION

F. X. Asselin
Vice President and Director
of Special Projects

W. K. Strand
Chief of Project

July 8, 1966

Regional Planning Council
803 State Office Building
301 West Preston Street
Baltimore, Maryland 21201

Gentlemen:

On May 1, 1964 the Regional Planning Council created a "Water and Sewer Advisory Committee" of which I have the honor to be Chairman, for the purpose of conducting a study of water and sanitary sewerage and drainage functions in the Baltimore Metropolitan Area. The Committee was appointed at the request of Governor J. Millard Tawes to undertake the study set forth in Joint Resolution 61 of the 1963 General Assembly.

On September 11, 1964, the Regional Planning Council, upon recommendation of this Committee, engaged the Stone & Webster Service Corporation, consulting firm, to undertake certain studies basic to the work of the Committee. A detailed report has been received by this Committee as representing the final work of this contract and is transmitted herewith to the Regional Planning Council. This report is entitled "Water and Sewer Utility Organization and Financing in the Baltimore Region, April 1966" by the Stone & Webster Service Corporation. Since the report is lengthy and technical, the Committee has asked Dr. Young to prepare a brief summary for your use.

In submitting this report, it is emphasized that the Water and Sewer Advisory Committee is not yet prepared to make recommendations concerning the program and conclusions contained therein. It is the consensus of the Committee that the report is a needed resource document and that it will be valuable to the Committee in completing its assigned responsibility.

Very sincerely yours,

Edward S. Corcoran, Chairman
Special Water Sewer Advisory
Committee of 14

GENERAL

Introduction

By the terms of an agreement executed on March 24, 1965, the Stone & Webster Service Corporation undertook to "study all water-sewer systems in the Region and make recommendations as to methods of modifying, integrating, or otherwise improving the fiscal-management systems of the Region's utility systems." This report presents our comments and recommendations toward this end.

Field work was begun in late March and was substantially completed by mid-June of 1965. The remaining time was taken up with analysis of the data collected and the formulation and testing of conclusions and recommendations.

Scope of Report

This report is but the latest of many studies and surveys of the Baltimore Region's water and sewer utility problems. It is, by request, predominantly concerned with management and organization and fiscal matters, and is not intended to cover either engineering problems or procedural and operational matters. Occasionally it does touch on such items, uncovered in passing and worthy of comment, and we have included our views merely as a possible aid to those concerned and as a reminder that the scope of this survey is limited. It must not be assumed by any means that what is not specifically mentioned in this report is going along well without need for investigation and improvement.

A substantial portion of this report deals with the question of integration or partial integration of the water and sewer systems of the Baltimore Region. Recommendations as to the future organizational and financial structures of these utilities are set forth herein under appropriate headings.

Form of Report

Inspection of the table of contents will indicate what form this report takes. It is unfortunate for the cause of a simple format that we deal with both

water and sewer operations. The Regional picture is better understood if they are inspected separately; however, it is not always feasible to do this.

In order to avoid an excessive volume of nonproductive verbiage, we have declined to present a history of the growth and changes in the several utility systems, unless mention of some past change, peculiarity or agreement is pertinent to the understanding of some phase of a present-day problem. Excellent and accurate histories exist in much of the published background material presented to us and it will be assumed that those desiring such background will have access to the same material.

The following six sections, up to and including "Conclusions and Recommendations," form the basic text of the report. The remaining five sections are in the nature of appendices, covering specialized material which may not be of prime interest to every reader.

EXISTING WATER & SEWER OPERATIONS

General

The two following maps illustrate in general the existing water and sewer coverage in the Baltimore Region, identifying each utility by its proper title and affiliation. The service areas shown must be considered approximate ones as spur lines may go out in a number of places and certainly not every spot within each area is within several hundred feet of a water or sewer line.

Using 1960 census figures, the populations and utility coverages in the Region were as follows:*

WATER

	City of Baltimore	Surrounding Counties	Total
Total Population	939,024	864,721	1,803,745
Population Served	906,900	536,100	1,443,000
Percent of Total	96.6%	62.0%	80.0%
Population on Interconnected System	906,900	357,600	1,264,500
Percent of Total	96.6%	41.4%	70.1%

SEWER

Total Population	939,024	864,721	1,803,745
Population Served	938,400	432,400	1,370,800
Percent of Total	99.9%	50.0%	76.0%
Population on Interconnected System	938,400	302,900	1,241,300
Percent of Total	99.9%	35.0%	68.8%

As might be expected, since the City of Baltimore is still the population center in this area and has had its own water system since the early 1800's and a separate sanitary sewer system since 1904, its utilities provide the major coverage in the Region, extending well beyond the Baltimore City boundary. The following section will describe the position held by the City in water supply and distribution.

* From Technical Supplement to the Final Report of the Baltimore Metropolitan Area Study Commission to the Governor of Maryland - September 1, 1963.

The Baltimore Integrated Water System

Map 1 on the following page shows the extent of the City of Baltimore water system. The grid service area is shown by the dark color and the ultimate resale service area (under the control of others but using city-supplied water) is illustrated by the dotted area.

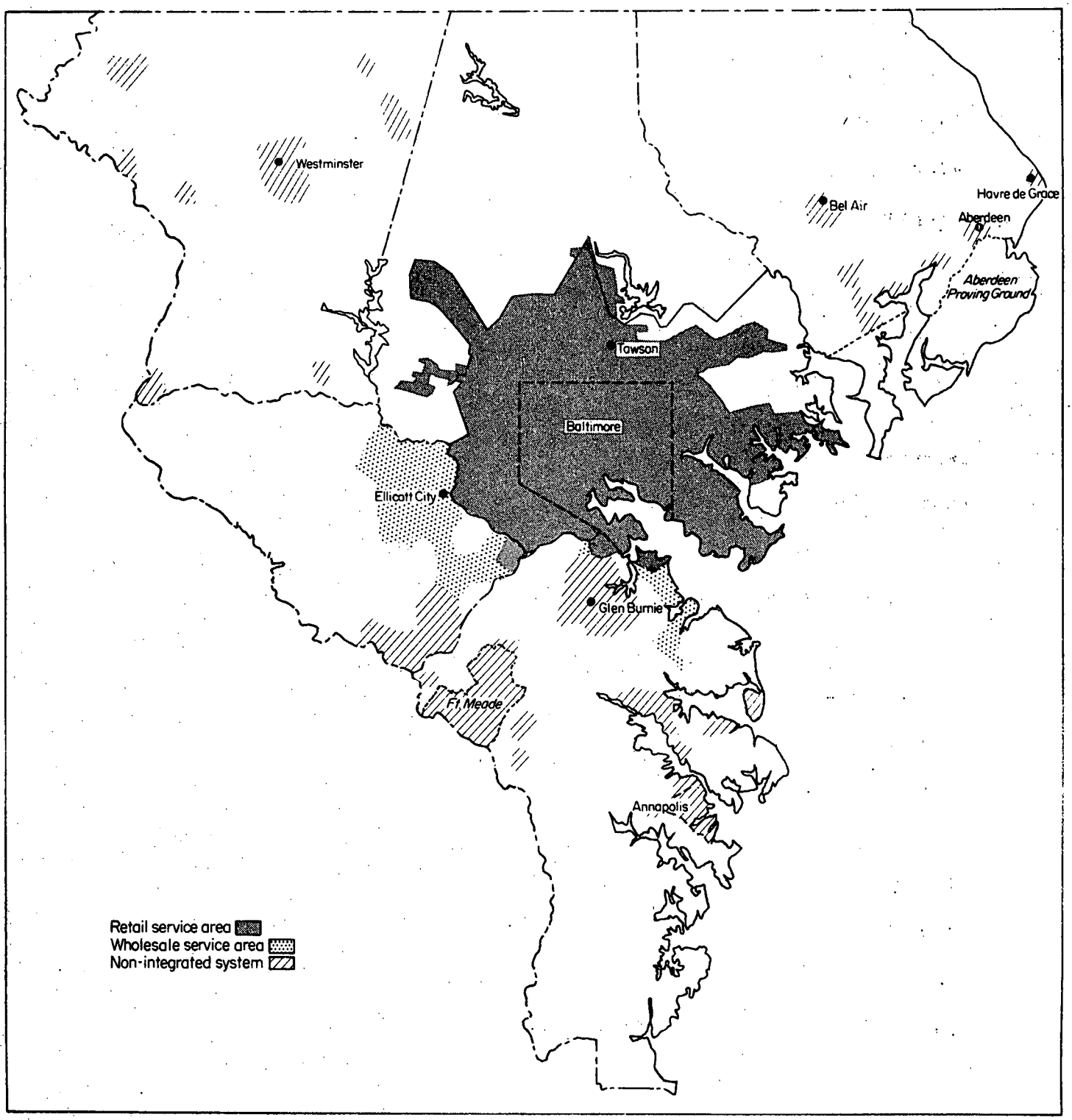
Of the 1,627,000 people presently estimated to enjoy public water supply in the Region, 1,425,000 or 87.6% are served directly from the City grid system (as "City customers") and an ultimate 1,462,000 or 89.9% of the total are served with city-supplied water. In terms of volume, in 1965 84,571 million gallons, or 93.5% of the total public water sent out into lines in the Region was collected and treated by Baltimore City.

Organization

This water utility is operated as a component (Bureau of Water Supply) of the City of Baltimore Department of Public Works. It is unfortunately impossible to consider the organization and functional operation of the Bureau independently of the Department of Public Works or even independently of the balance of the City Government. Some of the other Department of Public Works Bureaus provide important services to water supply and the Department as a whole relies on other City Departments for finance, accounting, customer billing, purchasing, legal services and the like. It will be seen later that, while this complex interrelationship provides some advantages, it is also the root cause of many of the problems and controversies besetting the water (and sewer) utility effort.

Map I

Baltimore Region Integrated Water System



Structure of Bureau of Water Supply

The City's Bureau of Water Supply is presently constituted as follows:

Division	Office Location	Operating Location
Executive Direction	Ashburton	-
Consumer Service	Ashburton	-
Engineering	Ashburton	-
Distribution	Park Terminal	Park Terminal
Plant Improvement	Ashburton	-
Pumping	Ashburton	Ashburton Pump Station
		Vernon Pump Station
		Guilford Pump Station
Purification	Ashburton	Ashburton Filtration Plant
		Montebello Filtration Plants
Watershed	Liberty Dam	Watersheds
Conservation	Ashburton	Park Terminal

Most of the divisions are currently performing the activity described by their name; a few, however, require some explanation.

The Consumer Service Division takes new and changed customer applications, handles complaints, maintains plots of mains, house numbers and connection numbers. It also handles meter reading and the subtractions, but does no customer accounting.

The Watershed Division handles sanitation, improvements and reforestation on the three watersheds owned by the City, as might be expected, but also operates a sawmill, which is claimed to be more than self-supporting.

The Conservation Division not only runs down main leakage, but also (a) performs hydraulic studies (tests) on main and network segments as a service

to the Engineering Division; (b) operates the meter test and repair shop and sets and replaces all small and medium meters; and (c) has relatively recently assumed the duties of maintaining and sometimes installing remote reading, telemetering and electronic equipment over the system.

Table 1 on the following page lists the total number of employees.

Integration with Baltimore County

More or less as a payment to Baltimore County (along with $35,000) for appropriating its major sources of water in 1908, the City of Baltimore agreed to serve Baltimore County with water at cost. This agreement dates from 1922 when Baltimore County had a population of about 80,000. Since that time the City (and more lately the County) has been constructing transmission and distribution lines in the service area without regard to their common boundary line. At the present time it would be, in the opinion of the engineers, almost impossible to valve off any significant number of these crossing mains, one reason being that at various conditions of supply and demand, flow reverses and Baltimore City may find itself served from Baltimore County.

In short, the County and the City are inextricably interconnected at all levels and it is out of the question to consider disentangling them.

The Metropolitan District

By act of the Maryland legislature in 1924 a Metropolitan Sanitary District was formed in Baltimore County (indicated on map 1 by means of a light solid line). This District effectively encompasses the County area that enjoys public water and sewer service (plus a few areas that would like to enjoy it). The District was expanded by a considerable amount this year, adding the entire area from Harford Road south to Chesapeake Bay.

Table 1

CITY OF BALTIMORE

BUREAU OF WATER SUPPLY

NUMBER OF EMPLOYEES AT YEAR END

Division		1959	1960	1961	1962	1963	1964 (Budget)	1965 (Budget)	1964
Executive	Salaried		8	8	8	7	8	8	9
Consumer Service	Salaried		87	95	95	92	100	98	89
	Per Diem		10	12	14	10	11	11	18
	Total		97	107	109	102	111	109	107
Purification	Salaried		12	13	13	13	13	13	14
	Per Diem		93	84	84	81	81	82	76
	Total		105	97	97	94	94	95	90
Engineering	Salaried		24	22	23	21	18	21	23
Plant Improvements	Salaried		30	38	33	30	41	36	27
	Per Diem		2	-	-	-	-	-	-
	Total		32	38	33	30	41	36	27
Distribution	Salaried		29	27	27	25	32	20	22
	Per Diem		367	355	361	353	275	275	345
	Total		396	382	388	378	307	295	367
Pumping	Salaried		36	34	34	34	40	43	35
	Per Diem		-	-	-	-	3	-	-
	Total		36	34	34	34	43	43	35
Watershed	Salaried		7	6	6	6	7	7	6
	Per Diem		65	63	64	61	60	60	60
	Total		72	69	70	67	67	67	66
Conservation	Salaried		3	3	4	7	6	9	10
	Per Diem		12	13	13	13	11	12	43
	Total		15	16	17	20	17	21	53
Total Salaried			236	246	243	235	265	255	235
Total Per Diem			549	527	536	518	441	440	542
Total Employees			785	773	779	753	706	695	777

Under the present-day method of operation, the Metropolitan District, as it pertains to water service, is merely a corporate shell, purely financial in character (with several small exceptions). Being empowered with bonding capacity up to 8% of ad valorem ratables within its limits, it is used to provide debt money for the construction of water facilities useful to Baltimore County both in the City and in the County. (The latter case is usually in the form of contributions to a joint project with the Bureau of Water Supply.) A more complete description of the Metropolitan District will be found in the following sections on integrated sewer operations.

The water customers in Baltimore County are handled as if they belong to the Bureau of Water Supply, with the exception that they have different rates. The Bureau collects the revenues and is obligated to reimburse the County for the difference between revenues and water "cost". This latter figure has been the focal point of much argument between the two parties, with such points as what proportion of the City's Bureau of Receipts and Accounts and Disbursements should be classed as proper charges against water customer billing and accounting.

As we understand it, the City contends that 57% of the time of its employees responsible for collection of water bills and the handling of other receipts is chargeable to water supply and thus proportionately to Baltimore County water service. The position of Baltimore County is that not more than 40% of the time of such employees is applicable to this service. The latter percentage was recommended in the report of July 30, 1962 on the subject of cost of furnishing water service to Baltimore County by City of Baltimore prepared by Dr. Abel Wolman and Ford, Bacon, & Davis, Inc. While other allocations are necessary to determine "cost" it is understood that there were no substantial

differences of opinion between the City and County representatives as to these calculations. The City's financial people, however, do not agree with this report's findings.

About 3,000 customers in the Brooklyn park area of Anne Arundel County are also served retail water by the City, but with no agreement to return any excess revenues; what is collected is kept by the City. In addition to this, the Anne Arundel Public Works Department (formerly the Anne Arundel County Sanitary Commission) purchases water from the City for resale.

The Howard County Metropolitan Commission also buys wholesale water from the City through two meters.

The Baltimore Integrated Sewer System

General

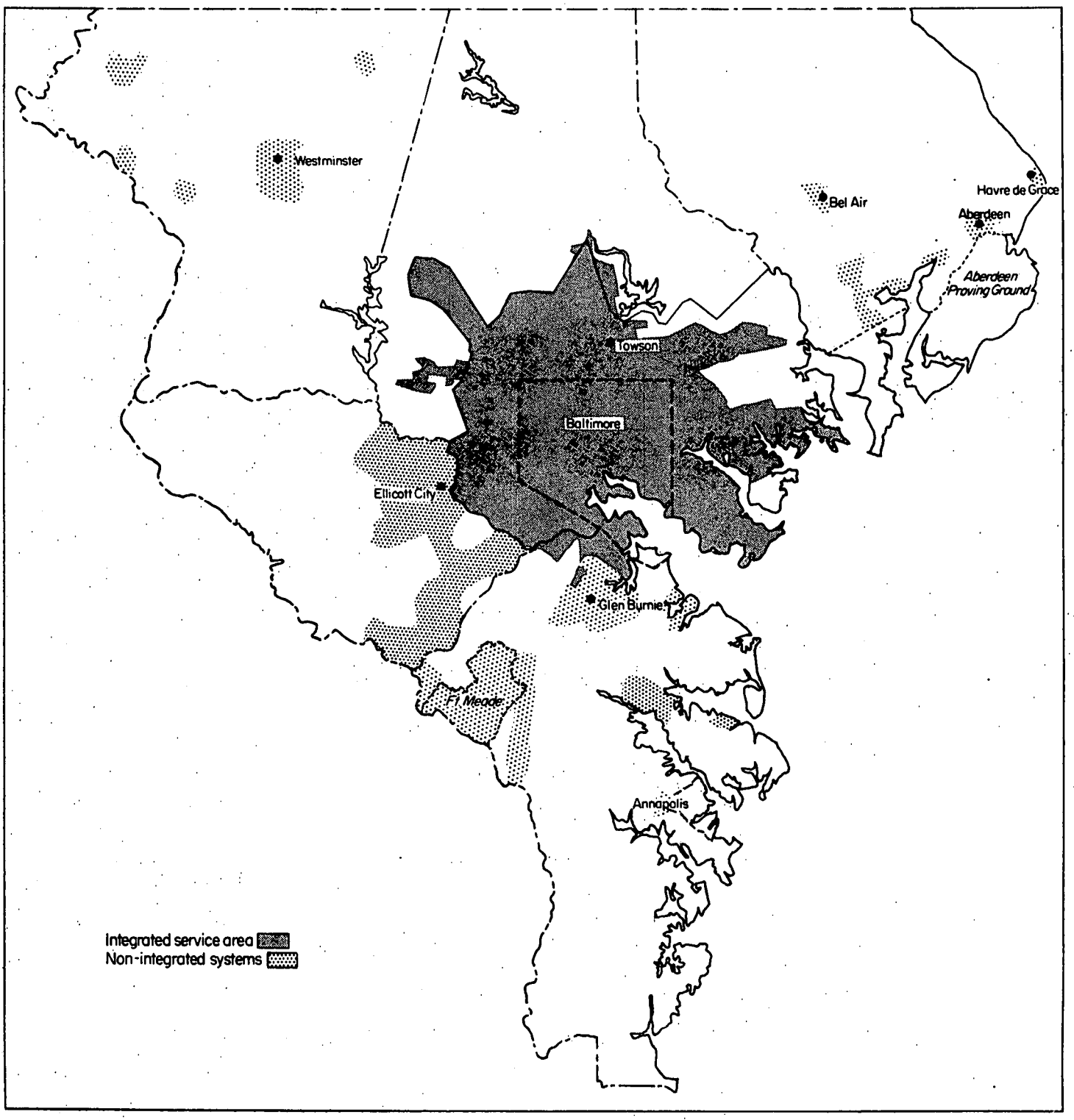
The City of Baltimore also possesses a large central sewer collection and treatment setup which also crosses the city line, providing service to Anne Arundel, Baltimore and Howard Counties. This crossover, however, is not in the same category as that of water, since the major sewer lines generally follow small valleys (unless they are pressure lines) and are far fewer in number than the water mains. Baltimore City therefore does not provide "retail" service to Baltimore County customers who are served by the Metropolitan Commission; instead it deals with the several sewer utilities involved and takes sewage on a "wholesale" basis. All mains and pumping facilities in the counties are built and operated by them.

Extent

Map 2 following presents the area served by the integrated sewer utility. The solid shading again denotes direct customer-to-city plant responsibility and

Map 2

Baltimore Region Integrated Sewer System



dotted areas indicate collection and treatment by others. (This map will shortly be outdated when a substantial portion of Howard County will convert from temporary plants and send sewage to the City.)

Organization

The City's sewers are constructed, maintained and operated by the Department of Public Works, Bureau of Sewers. This Bureau is constituted as follows:

Division	Office Location	Operating Location
Executive Direction	Municipal Office Building	-
Maintenance & Construction	Franklin Street and Calverton Road	Franklin Street and Calverton Road
Contract Construction	Municipal Office Building	-
Design and Engineering	Municipal Office Building	-
Pumping & Treatment Work	Municipal Office Building (Plant offices at Plants)	Back River Treatment Plant Patapsco Treatment Plant Eastern Avenue Pumping Station

The City of Baltimore built its sewer system relatively late in life and hence enjoys separate sanitary and storm drain systems, a rarity for old Eastern cities.

What the Bureau of Sewers does not enjoy, however, is freedom from storm drain work, which is assigned to it rather than to the Bureau of Highways, where it would be found in most cities and counties.

Total number of employees in the Bureau of Sewers is shown in Table 2 following.

Baltimore County Water & Sewer Systems

General

As was briefly mentioned on page 7, the Baltimore County Metropolitan District is at present a financial-geographic shell. It was an operating utility

Table 2

CITY OF BALTIMORE

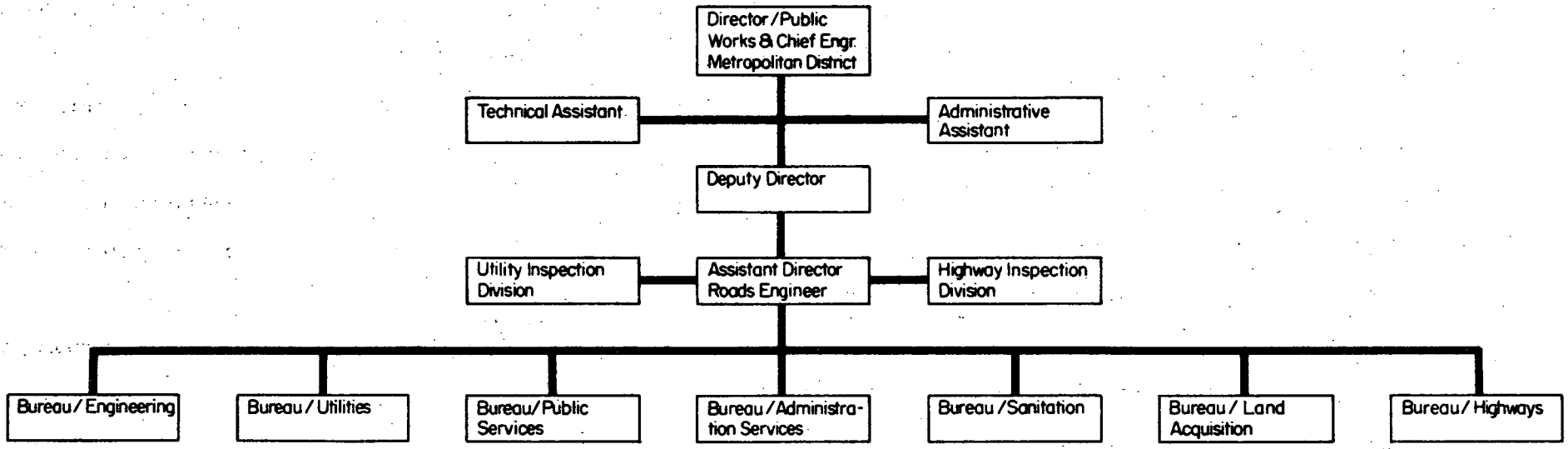
BUREAU OF SEWERS

NUMBER OF EMPLOYEES AT MIDYEAR

Division		1961	1962	1963	1964 (Budget)	1965 (Budget)	1965 (September)
Executive	Salaried	11	10	10	7	11	9
Maintenance and Construction	Salaried	18	18	19	13	12	9
	Per Diem	225	220	249	218	220	-
	Total	243	238	268	231	232	-
Contract Construction	Salaried	19	22	27	22	27	32
Design and Engineering	Salaried	25	30	25	62	44	26
Pumping and Treatment Works	Salaried	16	17	16	5	4	4
Back River Works	Salaried	61	60	58	69	71	74
	Per Diem	80	96	81	96	98	
	Total	141	156	139	165	169	
Patapsco Works	Salaried	8	9	10	11	11	(included in Back River)
	Per Diem	2	3	2	2	2	
	Total	10	12	12	13	13	
Eastern Avenue Pumping Station (and Others)	Salaried	11	11	10	9	10	11
	Per Diem	11	12	13	12	13	
	Total	22	23	23	21	23	
Total Salaried		169	177	175	198	190	165
Total Per Diem		318	331	345	328	333	
Total Employees		487	508	520	526	523	

Chart I

Baltimore County
Department of Public Works



prior to 1955 when the County Charter was implemented, involving a number of operating reorganizations.

Now the Baltimore County Department of Public Works performs the work of the old District, with almost all of the cost charged to three Metropolitan funds: operating fund, sinking fund and construction fund. As previously noted, the major effort the County puts in on water supply is in design and construction. Once built, water facilities are generally maintained and operated by the City Bureau of Water Supply. Exceptions to this are three small unattended booster pumps that were installed to improve pressure in elevated areas (the Bureau of Water Supply refused to consider these pumps) and a small isolated well system serving less than 100 homes in the Sunnybrook area.

Organization

The over-all organization of the Baltimore County Public Works Department is shown in the following chart. It will be noted by inspection of this chart that the Department of Public Works is organized on a functional basis (i.e. all engineering in an Engineering Bureau, all water and sewer operation and maintenance in a Utility Bureau, etc.) This is the direct opposite in organizational theory from, say, the Howard or Harford County Metropolitan Commissions, where all required functions from equipment maintenance and engineering through law and accounting are grouped under one control in an integrated operation with one end product in mind. The Anne Arundel County Sanitary Commission was also an integrated proposition prior to its merger into the County DPW under this year's charter revision.

The City of Baltimore's DPW is a semi-functional organization, since much equipment maintenance and all accounting are centralized elsewhere. The proposed reorganization mentioned on page 26 would completely place it in a Baltimore County-type functionalized position.

The bulk of the utility operation is carried on by the Bureau of Utilities and the Bureau of Engineering, with assistance from other DPW Bureaus, the Department of Finance and other County sections such as purchasing, legal, etc.

The Bureau of Utilities organization is presented in the following chart. Very few of these people are located in the general office (at the County Office Building in Towson). Most are in the Central Yard (Cockeysville) with the balance spread out into three other area yards, at Essex, Pikesville and Catonsville.

No meter readers are carried in the Bureau, as the City Bureau of Water Supply reads all County water meters (with the exception of the 60-odd in Sunnybrook which are read quarterly by the Administrative Assistant).

The Bureau of Engineering's chart is shown next, Chart 3. While only 27 people are on the table of organization for water and sewer main design, an equivalent of 95 people are being charged against the Metropolitan District Funds. This breakdown as well as the equivalent people in all County functions charged to the district are shown in Table 3.

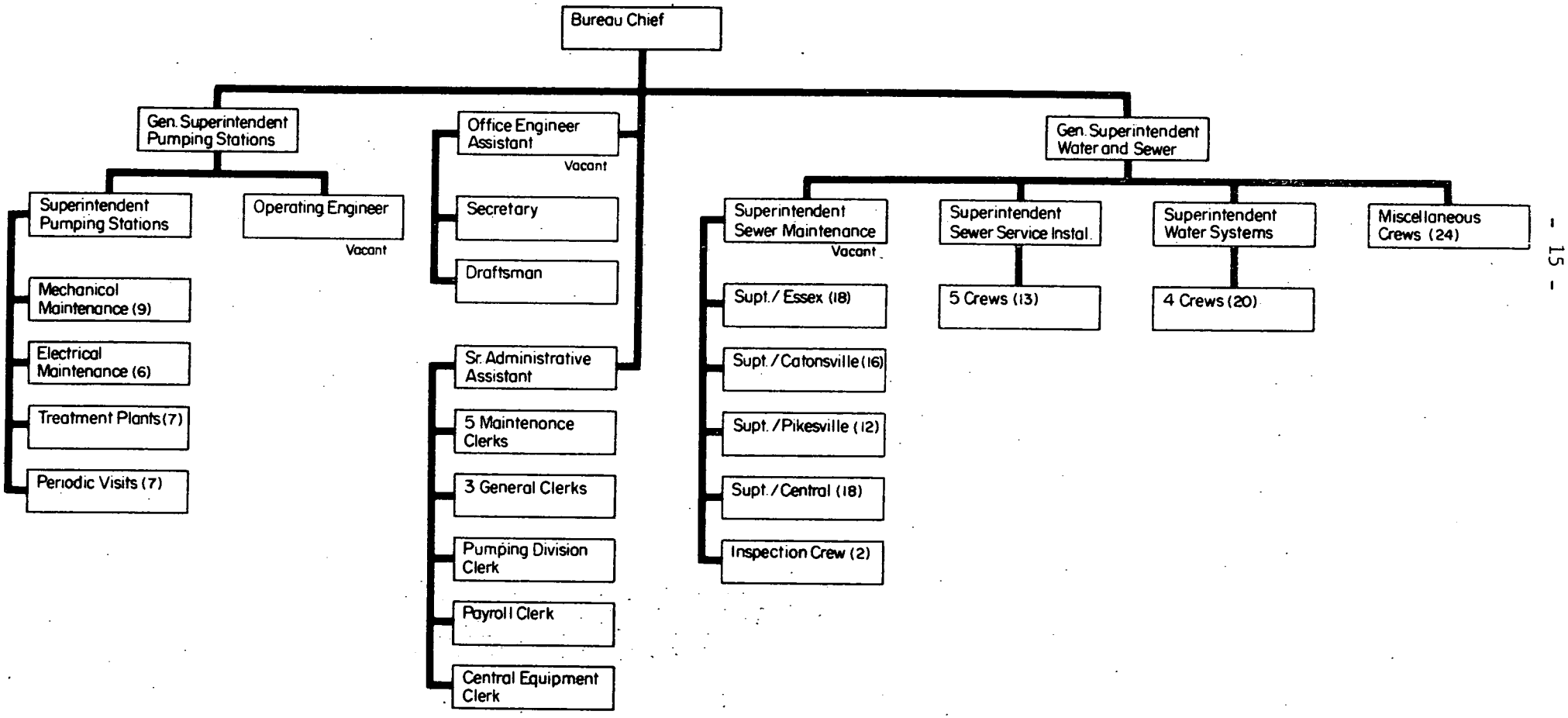
Anne Arundel County

Prior to June 30 of this year, utility operations in that part of Anne Arundel County not completely integrated with the Baltimore Bureau of Water Supply were conducted by the Anne Arundel County Sanitary Commission. This was a "standard" Commission set up in accordance with Maryland State Law and organized as shown in Chart 4 following.

The New County Charter implemented July 1, 1965 abolished the Commission and merged its departments into the County Department of Public Works. This merger and reorganization (assisted by administrative personnel on loan from the Westinghouse Corporation) resulted in a structure similar to that of Baltimore County and desired by Baltimore City, a so-called "functional" organization. The present organization is shown on Chart 5.

Chart 2

Baltimore County / Bureau of Utilities



Baltimore County
Bureau of Engineering

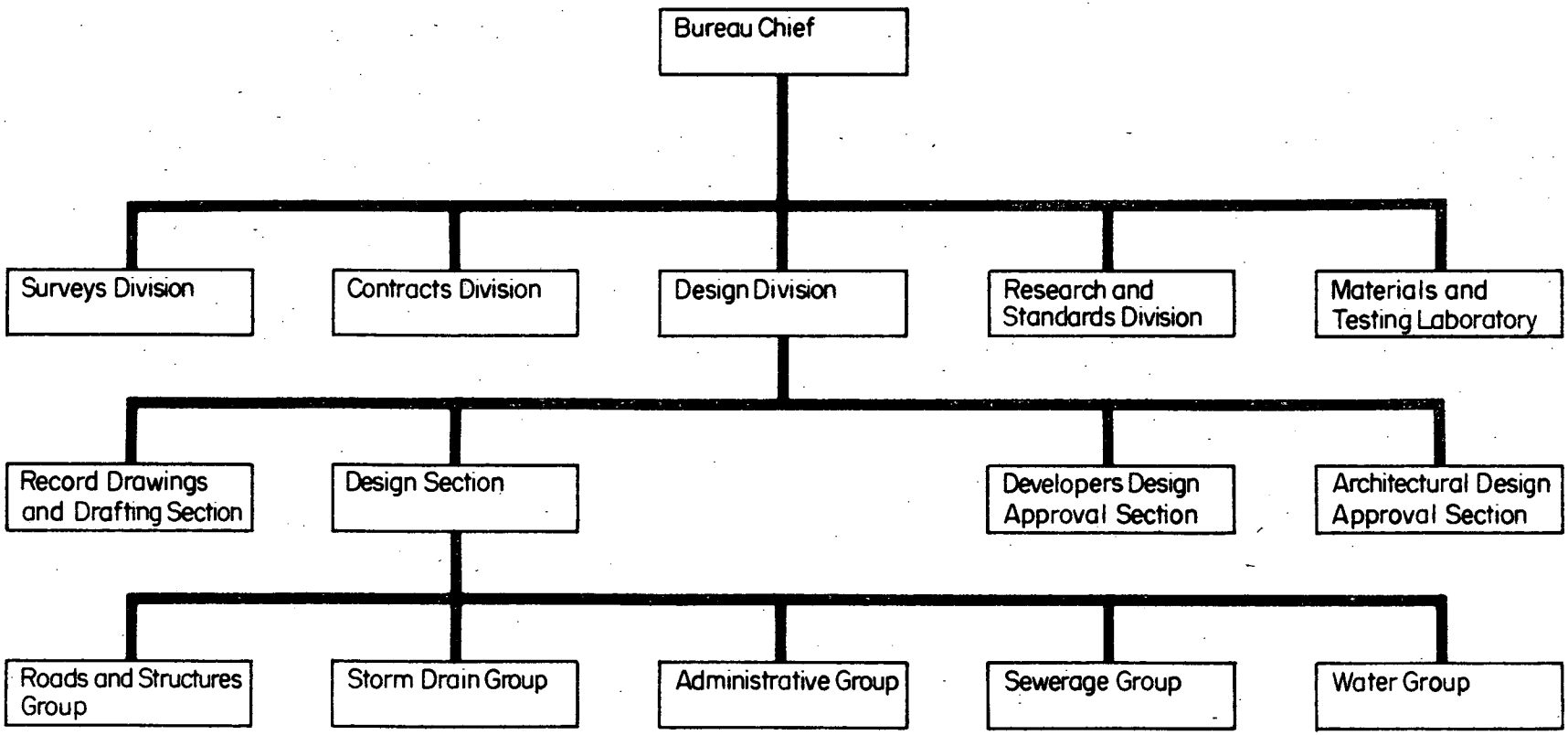


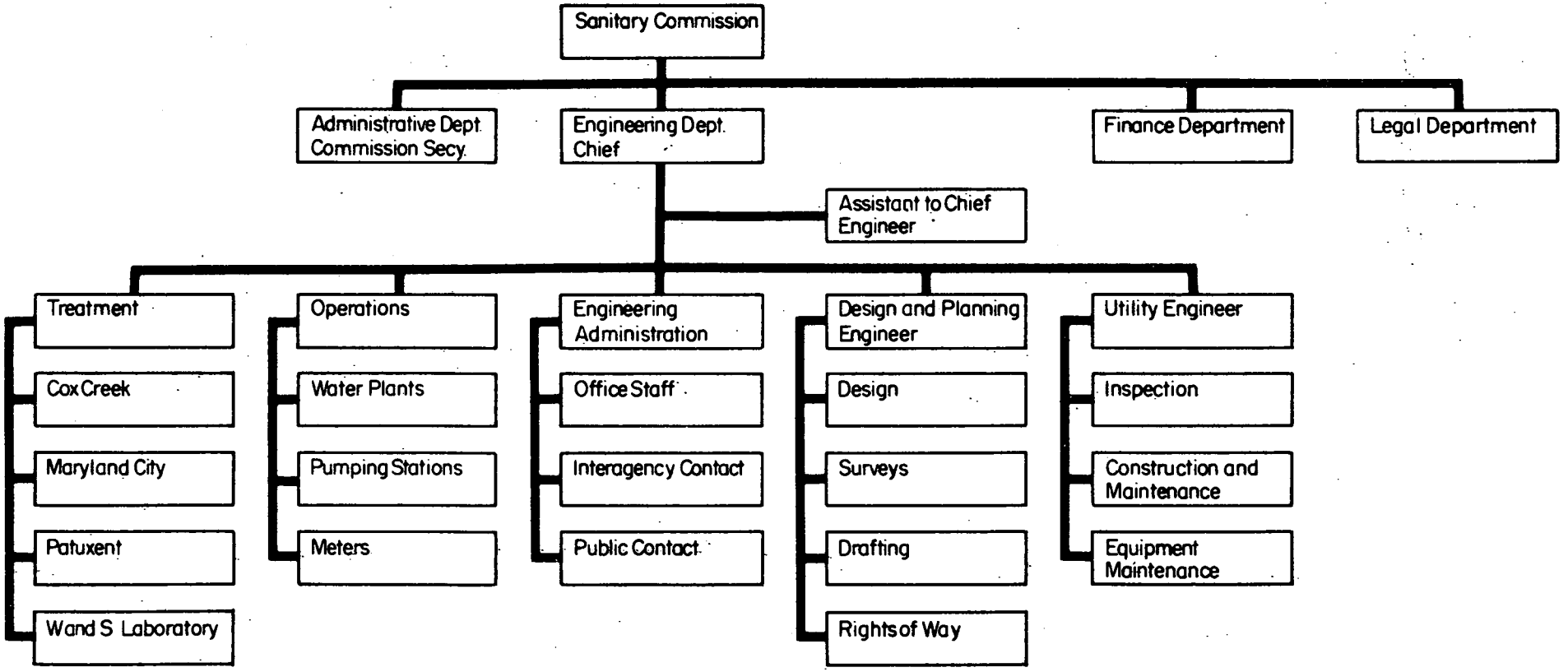
Table 3

BALTIMORE COUNTY

PERSONNEL CHARGED TO METROPOLITAN DISTRICT

	Equivalent People Charged
Office of Finance	
Front Foot Assessments	13
Other	15
Department of Permits and Licenses	
Plumbing Code Inspection	13
Water, Sewer and Gas Licenses	8
Director of Public Works	
General Administration	5
Bureau of Engineering	
General Administration	2
General Engineering	8
Testing Laboratory	4
General Surveying	28
Design Administration	3
Sewer Main Design	13
Water Main Design	14
Developers' Design Approval	12
Maps and Records Maintenance	6
Contract Administration	5
Bureau of Land Acquisition	
Rights of Way	17
Bureau of Operations	
Utility Inspection	38
Sewer Maintenance and Operation	109
Water Maintenance and Operation	13
General Administration	7
Pumping and Treatment Plant Maintenance and Operation	43
Sewer Construction	17
Water Construction	14
Bureau of Public Services	
General Administration	2
Land Development	4
Sewer and Water Extension Applications	10
Bureau of Administrative Services	
General Administration	10
Total	433

Organization of Anne Arundel County Sanitary Commission (Abolished 6/30/65)



The distribution systems are not all connected one with the other. Water customers are divided into nine districts, the largest (the General group, comprising North Linthicum, Linthicum Heights, Ferndale, Glen Burnie and Brooklyn) comprising about 16,100 of the 23,500 total. The other systems are

Pines	Belvedere Heights
Severna Park	Patuxent
Gibson Island	Maryland City
Riviera Beach	Providence

The largest of these is Riviera Beach with about 3,100 connections and the smallest is Providence with about 25.

Sewage customer groups number four, with General (North Linthicum, Linthicum Heights, Ferndale, Glen Burnie and Brooklyn) comprising 16,700 of the total of 18,900 and Maryland City, Patuxent and Riviera Beach holding the balance.

The personnel of the old Commission (excluding the Finance and Legal Departments) numbered as follows:

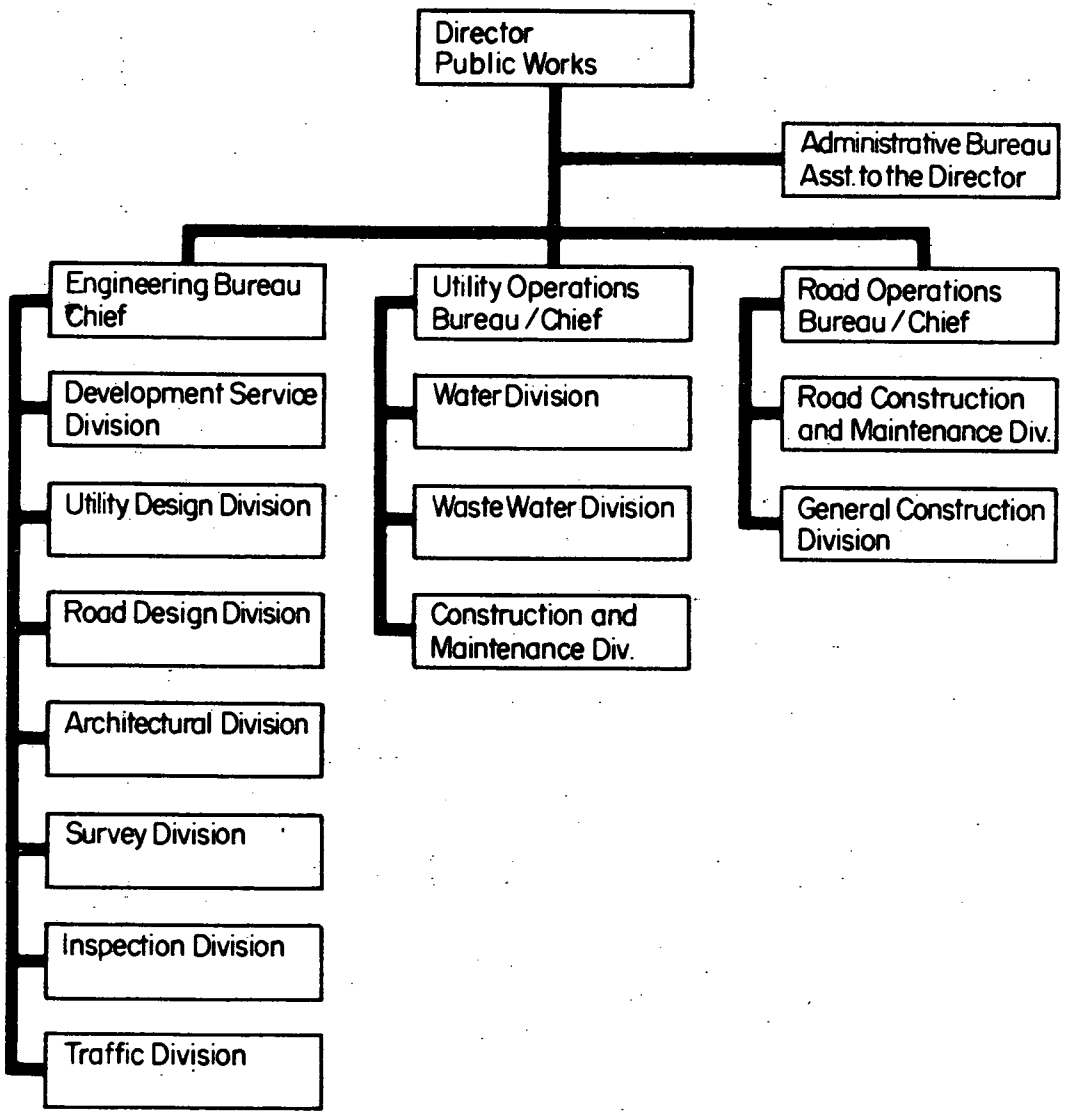
Department	Employed	Vacancies*	Total
Executive & Administrative	8	-	8
Treatment	11	3	14
Operations	27	8	35
Design	35	-	35
Construction & Maintenance	84	13	97
Total	165	24	189

* Average turnover vacancies plus added positions sought at the time of the reorganization.

The absorption of the Commission into the County Public Works Department did not materially alter the number of employees assigned to water and sewer work per se, but associated administrative policies have served to reduce the labor force.

The County Council Bill setting up the new Department of Public Works Organization describes in moderate detail the responsibilities of each Bureau,

Organization of Anne Arundel County Department of Public Works



and also empowers the County Executive to abolish or create divisions and sections within Bureaus the better to carry out these responsibilities. Apparently another legislative act would be necessary to shift a responsibility from one Bureau to another.

The Utility Operations Bureau has the responsibility for minor construction and the operation, maintenance, inspection and repair of all water and sewage treatment plants and pumping stations, water storage facilities, meters, mains, fire hydrants and field and laboratory testing, plus analysis of water and sewage. Obviously the name of the Bureau is apt, as the work assignment is purely operative.

The Engineering Bureau has the following utility assignments: the survey, planning and design of water, sewer and drainage facilities for installation by department personnel or contracted installations; the determination of the feasibility of utility service extensions plus all inspection of contracted installations.

The Administration Bureau has among other things the duty of developing capital improvement programs, maintaining liaison with other governmental agencies and the study of assessments, rates and charges.

Several interesting features pertaining to utility operations are included in the new County Charter. One states that if any utility operates at a net loss for three consecutive years, the County Council must adopt a rate schedule which will produce revenues at least equal to expenses.

Another feature is the specific requirement for "enterprise accounting" for utilities. If it "conforms to generally accepted principles of utility accounting" and is kept on an accrual basis, this would require that depreciation charges be made (as was done on a partial basis by the Sanitary Commission). Along with enterprise accounting is the requirement to pay "taxes not actually accruing but which <u>would have accrued</u> had the utility not been County-owned, and such taxes shall be paid annually into the general fund."

It is obvious that the authorities in Anne Arundel wish the users of water and sewer service to pay their own way and not rely on a general fund tax subsidy.

Anne Arundel County's sole water source other than its present small purchases from the City consists of wells. It is recognized that this underground supply will someday become inadequate. In the western end of Anne Arundel County, rock is reached at a shallow depth and the amount of water that can be obtained for any well is limited. Along the Bay, large pumpage rates could very well result in salt water intrusion, as has been experienced by industries in Baltimore.

Future increases in demand for water must of necessity link Anne Arundel closer to the integrated central system. An additional 20-inch line coming into the Brooklyn Park area is nearly complete. Water for Riviera Beach, the Marley Neck industrial area and the Hog Neck Peninsula is already being obtained from the City but the extension of service must soon be curtailed because of limited supply. The City is now planning a new crossing under the harbor which could supply Anne Arundel County with a future maximum of approximately 50 MGD. Preliminary planning is also underway to make more Baltimore water available to the entire northern end of the County following which the supply from existing wells would be directed to the area south of Glen Burnie.

An inspection of sewer service in this area indicates the problems arising due to faulty coordination in long range planning. The northwestern portion of Anne Arundel County and sections of Howard County must discharge wastewater into Baltimore County interceptors and this is then pumped into the City system for further transmission and treatment. Anne Arundel County, in the Brooklyn area, discharges directly into the City system. The proposed Cabin Branch system of Anne Arundel County is to be connected through a pumping station

to the Cox Creek system but if planning were coordinated through a Metropolitan system, the preferable solution would probably have been gravity discharge into the City's Curtis Bay system. A section of Baltimore City, east of Curtis Bay and north of the Coast Guard, would probably be served best by pumping wastewater to the Anne Arundel County Cox Creek plant. This has been acknowledged by City engineers.

Carroll County

The Carroll County Sanitary Commission was founded in April 1965. No staff currently exists other than the three Commission members, advised by the Chief Sanitarian and the Administrative Assistant of the Carroll County Commission.

A master plan was submitted by the consulting firm of Whitman, Requardt & Associates in December 1964, which forms the basic plan of the Commission's future activities. The County has included $25,000 in its 1965-66 budget as a loan to aid in furthering the operations of the Commission.

Seven of the eight incorporated towns in Carroll County supply water to their residents, three provide sewer service, one has sewerage facilities under construction and one is designing a sewer system.

Population Trends

Carroll is a predominantly rural county with but one sizable town, Westminster, the county seat, with a population of 6,123 in 1960. The population trend over the last three decades is as follows:

	1930	1940	1950	1960
Total County	35,978	39,054	44,907	52,785
Percent Increase	-	8.5%	15.0%	17.5%
Town Population (1)	9,635	10,079	12,590	13,198
Percent of County	26.8%	25.8%	28.0%	25.0%

(1) The towns of Taneytown, Sykesville, Manchester, Westminster, Hampstead, New Windsor, Union Bridge and Mount Airy.

It can be seen that there has been no great "urbanizing" trend, at least within the present town lines.

The one town without either a municipal water or sewer system is Sykesville. This town and its surrounding area happen to be located in the southeast corner of the county, that section which will be most affected by encroaching urban growth from Baltimore-Baltimore County. While the total county is undergoing a healthy growth, the census district comprising Sykesville and the two adjoining districts are growing at a faster rate, and the town of Sykesville itself is growing faster yet.

	1930	1940	1950	1960
Total County	35,978	39,054	44,907	52,785
% Increase	-	8.5%	15.0%	17.5%
Sykesville Area	9,326	11,198	12,979	15,584
% Increase	-	20.0%	15.9%	20.1%
Sykesville Town	661	806	941	1,196
% Increase	-	21.9%	16.7%	27.1%

In 1930, 1940 and 1950 this area almost exactly equalled in numbers the total in the eight incorporated towns. In 1960, however, the Sykesville area pulled ahead by about 2,400. It must be noted that this growth is taking place with a significant portion of the land area being taken up by Springfield State Hospital, Patapsco State Park and some of the watershed of Liberty Reservoir. (On the other hand, to some degree the growth in numbers in <u>on</u> the hospital grounds, since nearly 5,000 patients and staff are located there.)

While we understand that water and sewage disposal is now beginning to pose a problem in this corner of the county, it should be obvious that it is going to grow rapidly into a more and more serious problem. With individual septic systems in danger of polluting individual well systems (and conceivably also eventually

tending to pollute Liberty Reservoir), it appears that this area of three census districts and over 15,000 people should without delay be scheduled for central water and sewer service.

The "Master Plan Report Number Four - Water and Sewerage" devised by the Whitman, Requardt & Associates and adopted May 13, 1964 by the Carroll County Planning and Zoning Commission recognizes this Sykesville situation and recommends that "during the next 40 years" about half of the No. 5 (Freedom) Census District receive water and sewer systems, and also recommends that the fringe area surrounding Patapsco State Park and Liberty Reservoir undergo lot area control. We concur with the recommendations of Whitman, Requardt but reserve the comment that even the comprehensive portion of their building plan may be required well before 40 years have gone by.

One source of supply, economic only for the later development of this area, would be the Central System of Baltimore, through the Randallstown 5th Zone. The Bureau of Water Supply has classified this as impossible without reinforcement of the Randallstown system.

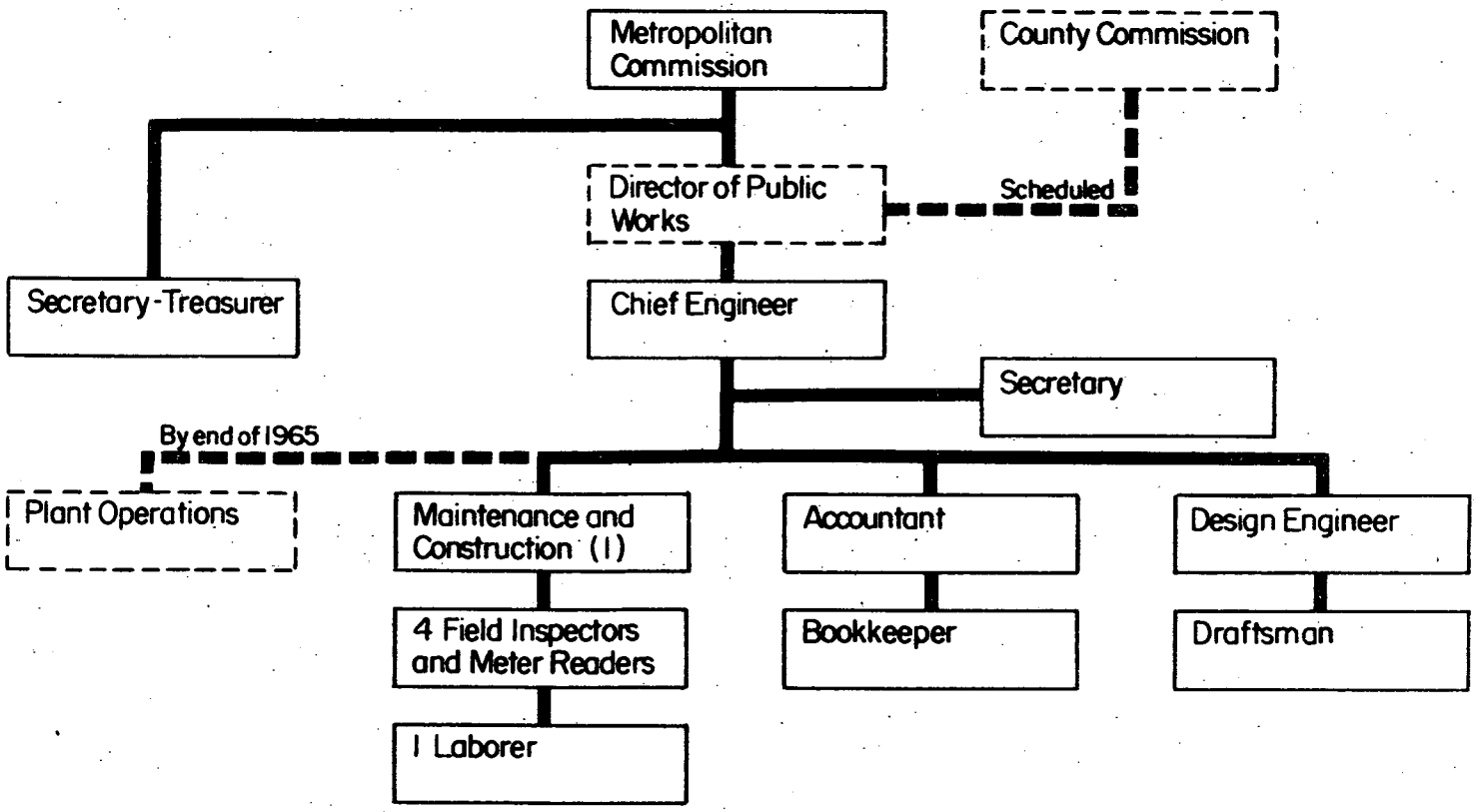
Harford County

Harford County is served by a Metropolitan Commission very similar in makeup to Howard County's. It was formed in mid-1963, in effect taking over the older, smaller sanitary district in Edgewood, formed in the mid-fifties. The towns of Bel Air, Aberdeen and Havre de Grace, and the army petitioned the legislature to be omitted from the district and they were.

Organization

The Commission is a very small operation at present, numbering but 12 employees at the time of our visit. They are organized as shown on Chart 6.

Organization of Harford County Metropolitan Commission



The introduction of the County Director of Public Works into the Commission picture was not an accomplished fact at the time of our visit, but was pending. The reasoning, apparently, is to allow the County Commission a slightly closer feeling of control over the utility planning in this rapidly expanding area, and also to make available from time to time some of the now-lacking facilities in drafting, engineering, etc., that the County enjoys.

Water Supply

Taking the entire County into consideration, Harford is probably the most self-sufficient in water supply of all the five, with the possible exception of Carroll.

The District now has an arrangement with Edgewood Arsenal to buy water and treat sewage. It is planned to withdraw from this interconnection by the end of 1967.

As a "right-of-way payment," Harford County is entitled to 10 MGD of raw water from the City's Susquehanna aqueduct. Some protracted negotiations on the price of this allotment have been recently completed. It is not likely that the full amount will be utilized in the near future, but 1 MGD would have been desirable some months ago. The Commission will likely develop an alternative source.

Winters Run can be developed by the Commission to provide a safe yield of from 6 to 12 MGD, depending on the amount of watershed control effort expended. This creek is also a supply for Edgewood (about 4 MGD) and Bel Air (about 1 MGD). Another option is the damming of Deer Creek, which would give a safe yield of 15 to 20 MGD. Aberdeen Proving Grounds is now taking from 4 to 6 MGD from Lower Deer Creek.

Susquehanna Aqueduct

The Susquehanna Project, a City of Baltimore proposition in the magnitude of $35,000,000, will eventually (with all pumps installed) be able to deliver 300 MGD to the City system. Only 150 MGD of pumping capacity is currently installed at the Deer Creek pumping station. This supply source will have the added benefit of permitting the present reservoirs to be drawn down well below current practice, before the more expensive pumping is cut in.

Howard County

The Howard County Metropolitan Commission, illustrated in Chart 7 following, is a "standard" sanitary Commission employing 24 people. It buys its water supply from the City and from the Washington Suburban Sanitary Commission near Laurel.

Sewage treatment is mostly through small temporary plants, but the construction program anticipates collection and treatment by the City system within a year or so.

The planned community of Columbia is moving toward finality southwest of Ellicott City, but is not expected seriously to disrupt the immediate financial plans of the Commission, as the developers will install all mains, etc. It will hasten increases in operation and maintenance costs as the Commission takes over the running of the utilities.

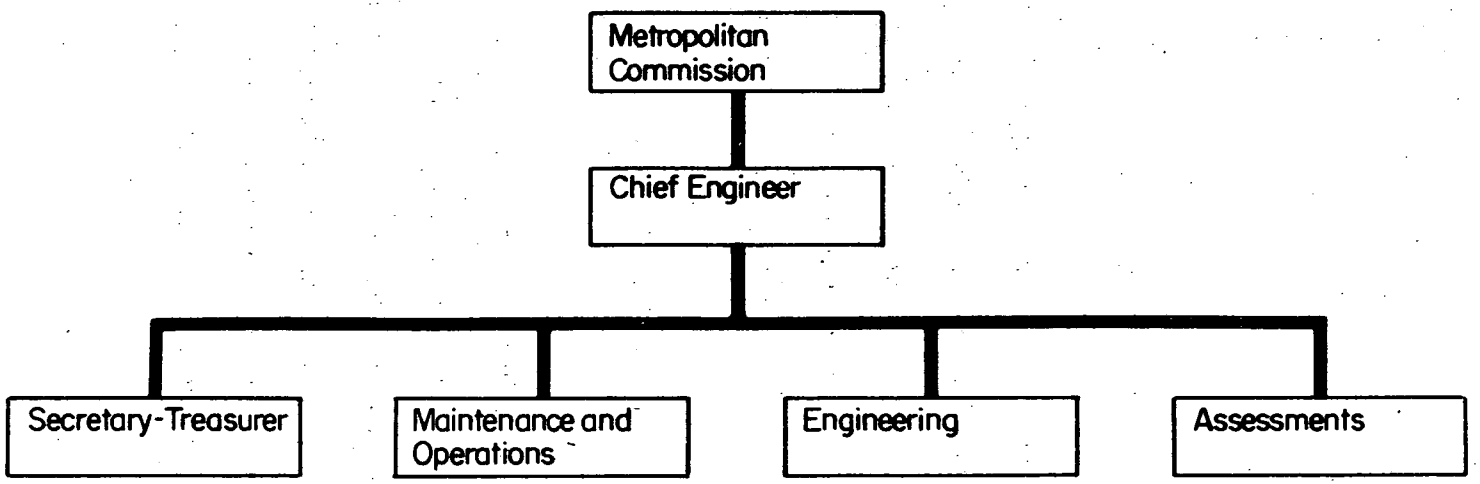
Municipalities

In addition to the foregoing Bureaus and Commissions, the Region with which we are concerned contains a number of incorporated towns with water and/or sewer service. These include:

Anne Arundel County

Annapolis	Water and Sewer

Organization of Howard County Metropolitan Commission



Harford County	
Aberdeen	Water and Sewer
Bel Air	Water and Sewer
Havre de Grace	Water and Untreated Sewer
Joppatown	Water and Sewer
Carroll County	
Hampstead	Water
Manchester	Water-Sewer Under Design
Mount Airy	Water
New Windsor	Water-Sewer Under Construction
Sykesville	No Service
Taneytown	Water and Sewer
Union Bridge	Water and Sewer
Westminster	Water and Sewer

In addition to these towns, the military has facilities at Edgewood Arsenal, Aberdeen Proving Grounds and Fort Meade; also various state hospitals and institutions have water and sewer plants of their own.

To the extent that the municipalities have supplied us with material or we have been able to abstract figures from publication such as the 1963 Technical Supplement*, we have included them financially in our study. Fortunately the largest utility, Annapolis, was one of the respondents and was also personally visited.

We have made no effort to obtain data from the government installations nor do we see any particular reason why any conclusions reached in our study will be in the slightest way affected by this exclusion.

The largest of these "independent" utilities is Annapolis, with a water plant capacity of about 4 MGD and a peak day of 3 MGD. The system is all well supply. About 6,000 connections for water take an average 2.5 MGD.

* Technical Supplement to the final report of the Baltimore Metropolitan Area Study Commission to the Governor of Maryland - September 1, 1963.

Annapolis now provides water service to areas outside its city limits, at a rate 1.5 times the normal rate. The city engineer has stated the city would like twice the rate.

An agreement is under study between Anne Arundel County and Annapolis for the treatment in the latter's plant of sewage originating in the environs of the city. Annapolis had long resisted such an agreement, preferring to wait for pleas for annexation before giving this "city" service.

PROBLEMS
CURRENTLY FACED

PROBLEMS CURRENTLY FACED

Operational and Organizational

There are not a great many "operational" problems faced today by the several existing utilities in the Region in the strictly technical sense of the word. In the more general sense, encompassing organization and procedures, there are many, of which the real sticklers are more accurately classified under the following sections entitled "Personnel" or "Financial and Contractual".

A multitude of relatively minor procedural inefficiencies abound, but rather than list them all here, we feel that they would be more briefly and aptly presented if they were referred to in passing, as specific recommendations are made later in the report.

Without at the moment joining the problem with the specific utility (many are symptomatic of all the utilities), we will present the more serious operational, financial and organizational problems evident in the water and sewer field.

Liaison between utilities is sporadic. Between those groups where contacts must be made, such as the Bureau of Water Supply and the Baltimore County DPW, regarding new mains, pumps, etc., liaison occurs, but not on a comparable level, subject to sensible understanding; nor in any formalized manner but of necessity, between the individuals where it worked once before.

We wonder at the reasoning that demands that consultants represent the city and county in their negotiations on water and sewage costs, rather than a certain level of employee on each side.

Some of the leading managers dealing with water, sewerage and public works in general in the five counties and the city do not appear to know each other well.

We wonder also that all managerial levels of the region's utilities were not fully aware of this particular study or indeed of the existence or composition of the Regional Planning Council.

Since this study was initiated, the Regional Planning Council has promoted the organization of a "utility sub-committee" consisting of key persons involved in utility planning and programming. This committee is now advising on utility aspects of the General Development plan for the Region which the Council is preparing.

Information dissemination within utilities is also sporadic. It is difficult to back up this statement with examples important enough to sound worthwhile. In general this item is composed of innumerable petty instances made evident only by inference and deduction in the course of our interviews. Apparently in the entire Region no "house organ" or periodical publication is put out for the benefit of utility employees. These can be very valuable if well done.

Accounting functions are too often isolated from operating people. Of course physical isolation, in other departments or buildings, is no real detriment providing that fast and sufficient reporting of revenues and costs is provided. This is not the present case in some utilities, though we are aware of efforts being made toward a greatly improved picture in the city. Annual reports are fairly slow in reaching published form. (Part of the delay stems from required competitive bidding for the printing operation.)

The accumulation of financial data in special form for the purposes of special studies can be at times a serious problem.

Physical isolation helps a good deal, however, in creating time lags and frustration. In Baltimore County, the isolation is separate departments in adjacent buildings; in the city it can be separate departments five miles across town; in Anne Arundel County it can mean separate departments in two towns 15 miles apart.

It is possible to trim requested utility budgets because of nonutility reasons. An example of this has been apparent in the deferred maintenance of past years at the city's Montebello filter plants. This maintenance slowdown has since been corrected by some extensive rebuilds, requiring contractor performance, and served as a very strong reminder of the old maxim "keep maintenance up".

On the reverse side of the coin, it has been possible to trim important items elsewhere in budgets because of water and sewer items. The City Planning Commission's six-year Capital Budget document describes the policy on construction devised by the Committee on Financial Policy in 1961. This policy prescribes a limit on loan funds of $35,000,000 in any one fiscal year plus an amount equivalent to a one-cent annual increase in the tax rate starting at three cents in 1962, with a limit of ten cents. (The latter figure would be about $1,600,000 in 1965.)

This guideline may not seriously hamper utility construction due to its essential nature, but according to the Planning Commission the inclusion of supposedly self-supporting items such as water supply in the over-all policy tends to squeeze out other desirable but deferrable items such as education.

Strong unified leadership is not available to some utilities. We do not mean that strong leadership does not exist. In each of the operating utilities there are capable men in charge. (In several these men are extremely capable and versatile as well.) But we refer to the organization Charts 4 and 7. These represent integrated "normal" type utility operations as close to that of a regulated private utility as can be found in a publicly owned service. A Commission exists to formulate policy and exercise ownership and legal powers, but the executive control is mostly in the hands of one individual, the Chief Engineer.

In Baltimore County, however, operational executive control is exercised by the Director of Public Works, who must form the top connecting link between the five Bureaus that have something to do with utility operation, as well as with the Director of Finance, who controls accounting and assessments. In addition to utilities, the Director must oversee the major functions of sanitation and highways and a number of collateral activities associated with his position. His full time cannot,

obviously, be devoted to utility operation. The men whose full time can be are not able to control other functions vital to utility operation nor in some cases are they the peers of the heads of these other functions.

An almost similar situation exists in the City of Baltimore. While smoothing relations between Bureaus is not the problem it is in the county, there are even more meetings, hearings and other command performances that the Director of Public Works must attend.

Chart 6 illustrates the pending imposition of the Harford County Director of Public Works on the Metropolitan Commission chain of command. This can function and apparently a need is seen for it, probably to aid in Commission-County coordination. Yet organizationally it places one man in the position of working for two superiors. Since the Metropolitan Commissioners are appointed by the County Commissioners, one might assume that both bodies will think along the same general lines. It is easy to picture just the reverse situation, however.

Intramural inefficiencies can be perpetuated in some of the present organizations. For example, up until the current year, the Bureau of Water Supply was required to make use of the Bureau of Mechanical-Electrical Services for maintenance at a cost of at least $60,000 per year. We understand that this is no longer the case and it is expected that some savings will be realized by being able to contract some of this maintenance effort.

The Bureau of Transportation maintains the cars and trucks of the Bureau of Water Supply but will not (or cannot) maintain equipment, which is done by Water Supply or farmed out to dealer garages. The Bureau of Mechanical-Electrical Services will work on equipment but it has been the experience of Water Supply that the central yard is too remote for rapid delivery and return. The whole system is not working well. We understand that the services of the Bureau of Transportation will possibly

improve when their new facilities are completely operational. The maintenance of construction equipment by Bureau of Water Supply people is not satisfactory because the authorized positions for the proper mechanics do not exist.

Equipment policy. Both the City's Bureaus suffer from the lack of an intelligent vehicle and equipment replacement policy arranged to give reliable service for the lowest cost. This lack of policy forces the retention of equipment until it is practically scrap. This will not do, unless money is in excess supply. Either too much manpower and money are expended keeping pieces operative to avoid lost crew time, or lost crew time results and the work at hand is delayed.

Too much auxiliary equipment (such as Bureau of Sewers mobile pumps) is plainly obsolete.

Central purchasing. Central purchasing is simply not functioning well. We refer particularly to the City and Anne Arundel County. Not because of centralization itself, but because of failure of those in Purchasing to grasp one essential element of operating a technical enterprise; namely, that all items of materials and apparatus cannot be purchased on the basis of price alone. This point should not need elaborating. More control must be allowed the utility people in asking for what they want in the line of equipment, control apparatus, replacement parts, etc. We feel a very serious diseconomy results under the present system. It cannot be proven in the aggregate, but many spot examples can be obtained where shorter life span, poor performance and plain malfunction are purchased for a price a few dollars lower than that of the recommended item.

Confusion due to reorganization. The previously described change in Anne Arundel County has not been accomplished with any noticeable degree of smoothness. Attendant upon the implementation of the absorption of the Sanitary Commission

into the Public Works Department (itself a new organism, previously comprising solely highway work) have been difficulties in titling supervisors and getting them into salary brackets commensurate with their duties and previous salaries, pay reductions, several resignations from the labor force, the introduction of a local of the State, County and Municipal Employees' Union and a probably unwise restriction on Department-performed construction.

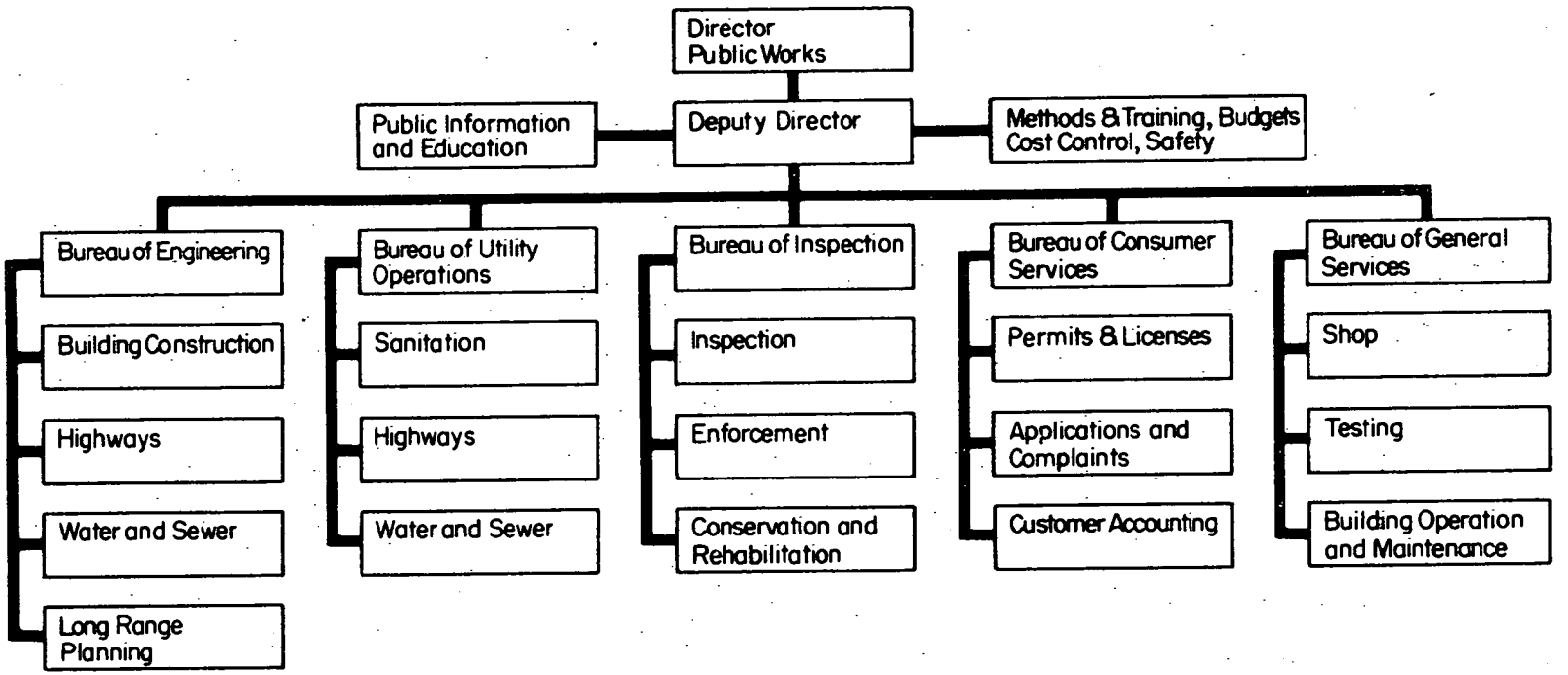
This confusion has not been the result of anyone's resisting the change in organization, which after all was required by law. It seems to us simply the result of assuming a reorganization is little more than a moving of furniture and partitions, capable of accomplishment over a weekend, and of assuming that people, singly or in groups, can be assigned and transferred to new situations as quickly and cleanly as can pickup trucks. It behooves the City of Baltimore, if it intends to carry out its intended changes (described in the following section), to study Anne Arundel's experience and avoid any similar mistakes.

Proposed reorganization of City of Baltimore - Department of Public Works. An ordinance was introduced to the Baltimore City Council on March 29, 1965 for the purpose of reorganizing the City's Department of Public Works from its present ten Bureaus to five Bureaus. This ordinance implements the report of a three-man special committee which was submitted October 8, 1963.

In essence, the reorganization makes the transformation outlined below:

Present Bureaus	Proposed Bureaus
Highways	Engineering
Mechanical-Electrical Services	Utility Operations
Sanitation	Inspection
Surveys	Consumer Services
Building Inspection	General Services
Building Construction	
Sewers	
Water Supply	
Tests	
Transportation	

City of Baltimore
Proposed Reorganization of the Department of Public Works



From Wolman Report of 1963 and proposed Ordinance No. 1075

The ultimate aim of the reorganization is, as the names of the proposed Bureaus indicate, to group all like functions of the Department under single control; thus all engineers from Surveys, Highways, Water Supply, etc., would be brought into the Bureau of Engineering.

Taking a regional view, perhaps this reorganization could be termed desirable since it would bring the city into the same organizational pattern now in effect in Baltimore and Anne Arundel County. Thinking in terms of water and sewer operational efficiency, it does not appear to us to provide marked advantage over the present system unless superfluous positions are earmarked for extinction when the present incumbents retire and necessary vacancies are filled.

The proposed reorganization, if carried out, will not make any further reorganizations such as studied in this report any easier to effect; rather it could conceivably complicate them.

Planning for Future Growth

That the Baltimore Metropolitan Area is due for future growth is not in question. The accepted population projections for the Region represent an increase of over 600,000 from the present number in the next 15 years. It may be safely assumed that at least a proportionate share of industrial and commercial growth will accompany the surge in people.

We do not see a uniform, well-planned attack on all fronts in the planning for water and sewer service to meet this growth. We do not say the administrators and engineers are unaware of it; it is that other things have intruded.

Baltimore County, deeply involved in present-day growth crises, is on the one hand wondering how to bring utility service to those in the Metropolitan District now without it, while on the other hand working to keep up with the 4% annual

population increase. Coincidently, it has awakened to the fact that its prior utility financing practices are complicated, inequitable and confusing.

Anne Arundel County, long struggling with a backlog in utility work, has its well-functioning Sanitary Commission set back for a time by a crash merger into the County Public Works Department. Anne Arundel possesses, in the opinion of many planners and engineers, the prime future industrial belt in the Region. Water and sewer service may begin to be the subject of debate as they tend to hold back the development of this industry.

Howard County, well launched on a 5-year utility program, suddenly finds itself with the beginning of the first "new town" in the Region, for which it will find services, with the backing of the developer, but perhaps not easily and not without some worry over the future.

Carroll County, with no county-wide organization yet in existence, at least has a long-range plan and may correct the Sykesville condition before it becomes dangerous. The small communities in this county that are now providing water and sewer service are to be heartily commended for such energy.

Harford County is busily formulating its own plans and is financially able to initiate them. It is, however, feeling the lack of county-wide and region-wide master planning (not the fault of the Metropolitan Commission) in its efforts to establish a logical and economical construction program.

Annapolis has been foresighted and ready with water and sewer facilities able to serve not only its own territory but its "metropolitan environs". (It must be admitted, perhaps, that the motive was the encouragement of annexation, but the hardware was provided, regardless.)

The City of Baltimore has been the planning genius of the group. It has of course had a large population of its own for many decades for which it has had to provide, but it has also plunged ahead with facilities aimed almost wholly at

meeting growth outside its city limits. It is disturbing that in a review of this foresight, it appears that it has been the result of reflex action on the part of the engineers, the technical equivalent of "the show must go on", "provide the services to the people - forget the organization and the financing"*.

It is significant, too, that credit for this long-range planning has almost entirely accrued to consultants and panels of advisory engineers. The staff of the city has participated, but has not been given much credit for being in a managerial role.

Planning is going on, but the loose ends are piling up for the financial and accounting people to haggle over. However, the hardware is there and the area may generally thank the city (and its advisors) as well as the several smaller municipalities.

Since this study was initiated, the Regional Planning Council entered a new phase in its utility studies.

In response to its legislative mandate to prepare a General Development Plan for the Region and also in response to impending comprehensive planning requirements for Department of Housing and Urban Development utility grants, the Council is preparing a utility component of its regional plan and a related six year capital program. This work is being closely coordinated with the local governments and their agencies through the Utility Advisory Subcommittee mentioned earlier as well as by meetings with individual agencies and other means.

Possibilities of Rapid Local Expansion

Growth in general for the Baltimore Region is expected, inevitable and welcomed. It has happened in the past and has been dealt with more or less successfully. But compared with what the future could bring, past problems may be looked upon as a mere warm-up exercise.

*Almost wholly in line with the reasoning deplored by Hirshleifer, Dehaven and Milliman, "Water Supply - Economics, Technology and Policy".

Not only is "normal" growth of a large population greater in absolute numbers than that of a small population, but we are now well into the era of the mushroom "new town" or planned development phenomenon. We have had the Levittowns and the Florida retirement cities for some years. Now, closer to home, we see the approach of Reston, Virginia and Columbia in Howard County. The former is expected to have 75,000 people by 1980. This is hardly a mushroom category, since after all this represents 15 years (5,000 per year - a growth rate of approximately 28%). Columbia is expected to house 110,000 by 1975.

Since the concept of developing a suburb out of a farm is well established, and since the idea of new towns is being actively encouraged, we may confidently look forward to one or more of these communities actually taking root in the metropolitan region.

Not all of the inhabitants of such a community will be "new" or from the outside. Many will merely shift from other locales in the area or will be new households forming from the ranks of the teen-agers or college graduates. But they don't bring their water mains with them.

It may be (and in the case of Columbia, will be) that the developers finance the required sanitary utilities. But this is only money; the supply and disposal points must be there. Imagine the impact of 100,000 people within five years in central Baltimore versus what it would be in Mount Airy. Yet utilities <u>if planned in concert</u> with plans for the development of the Baltimore Region and its component jurisdictions can efficiently serve new community areas. The challenge here is to integrate the planning of utilities with the planning of land use, transportation and other elements to insure that the policies of local and state governments and their agencies in regard to urban development are in harmony and

will, in fact, work to achieve public goals and purposes. Piecemeal planning must be replaced by comprehensive planning if orderly development is to be achieved.

Personnel

Personnel problems are now looked upon as being so specialized and complicated that it might be questioned whether they should be covered in this study, which has a subject sufficiently complicated. "Management" as such, however, has been many times defined as the art of dealing with people, getting people to work together efficiently, keeping people happy, etc. There is no getting away from people.

It is obvious, from studying past reports and records, from talking to people in the utilities and indeed from reading the newspapers, that municipal and county civil service in the Region is in trouble. This trouble, as it bears on the subject matter of this report, stems from the following facts:

1. Starting salaries are too low to attract and keep well-qualified people.
2. Advancement on merit (demonstrated ability) is uncertain.
3. Managers have too little control over the salary, training and advancement of their subordinates.
4. The City of Baltimore Civil Service appears to be too complex and cumbersome to react quickly and completely to correct such faults as listed above. (This may be the result of political interference and inability to move as much as it is the result of any great failure on the part of Personnel.)

These basic faults account for a number of unfortunate situations in the operating utilities. These conditions have been brought to the attention of management time after time. In the City of Baltimore one of the most recent has been the Appendix of the 1963 DPW reorganization study. This Appendix, written by two

personnel supervisors from Baltimore Gas and Electric Company and Chesapeake and Potomac Telephone Company, very succinctly points out that:

(a) Starting salaries are too low.

(b) Progression relies too much on minimum time in grade and competitive examination.

(c) Training of position understudies is uncertain and often futile due to examination requirements.

(d) The age distribution in the DPW is such that in the long run no talent will exist for promotion to the top jobs.

(e) Engineers are burdened by nonengineering chores.

(f) The possibility of stultification exists since there is no mandatory retirement age for Bureau Heads.

(g) Bureau Heads have almost no power to adjust employee job classifications and salaries.

(h) Civil Service has too few job analysts.

Another problem is that Baltimore City Civil Service will not recognize the grades of Engineering Aide and Senior Engineering Aide as being a step on the way to an engineering career. Instead they are looked upon as surveying positions. This effectively prohibits much of the hiring of young men attending college in evening sessions, etc., who cannot qualify at once for an engineering title but could be of considerable service to the Bureaus of Water Supply and Sewers as Engineering Aides. No one will take the positions if the time spent in grade cannot be applied for advancement.

Approximate starting salaries for engineering graduates in the Region are shown in the comparison following:

City of Baltimore	$6,468	(Assistant Engineer)
Baltimore County	6,346	(Engineer IV)
Anne Arundel County	6,386	(Civil Engineer I)
Potomac Electric Company	$7,280	
Baltimore Gas and Electric Company	7,280	
Federal Government	$5,990	(GS-5)
Federal Government	7,050	(GS-7)

The sum total of these defects is that the utilities large enough to operate under a civil service or "merit" system have a serious morale problem; it is serious enough to warrant extreme corrective action.

Financial and Contractual

A number of annoying and sometimes serious problems currently faced may be classed in the category of contractual arrangements between utilities. The ever present problem of financing is also a serious matter for the Region's political bodies.

One of the more serious setbacks in this field was the October 1964 reduction of the City of Baltimore's bond rating from AA to A by Moody's Investors Service. Moody's statement on their rating change stated in part - "One of the factors which disturbed us has been the mass migration of middle-class families out of city and into the suburban county. Another was the rapid rise in debt over the past six or eight years, contrasted to the static picture of assessed valuations over the same time period. Although the city's capital improvement program, including the urban renewal aspect, appears necessary and meritorious, it will add to debt burdens. We find little in the Baltimore picture to distinguish it from other large, A-rated cities on the eastern seaboard and consequently changed its rating".

Also in 1964 the bond rating of Anne Arundel County was reduced from A to BAA by Moody's Investors Service. The cumulative effect of this reduced rating

on bond interest costs of new debt securities will also be substantial unless the rating is raised.

As has been mentioned on page 17, Harford County is entitled to 10 MGD of Susquehanna raw water, but was unable for some time to negotiate with the city a price for this allotment. While this has now been settled, it would seem that an interim agreement could have been arranged long ago, subject to later adjustment if need be, when actual pumping and maintenance costs are known.

One cause of friction between Baltimore City and Baltimore County are the provisions of the 1924 Metropolitan Act and Chapter 1017 of the Acts of 1945 which require the city to serve the county with water at cost. Argument has arisen over two points; the "at cost" provision (actually reading "without profit or loss") apparently has been at times altered to "without profit" in negotiations between consultants representing the two parties. Central to this argument is the proper proportion of customer accounting charges that should be included in the determination of water costs. The city contends that as much as 57% of the cost of the Bureau of Receipts can be justified as applicable to servicing water customers, whereas the Baltimore County representatives have contended that the allocation of 40% is more nearly correct. The 40% ratio was recommended in a 1963 study by consultants representing both parties.

The rebate for excess water collections over cost by the city to the county were settled on a negotiated basis through the year 1963. The charges for subsequent water service are in controversy and remain unsettled.

Of even greater importance is the allocation of capital costs required to serve both county and city customers. The Susquehanna aqueduct provides a good example: its $35,000,000 cost was primarily made necessary by growth in Baltimore County, but under current methods of allocating "source development" or "central system improvements" the county would pay on an actual volume-taken basis year by

year, and by the time it will have grown to the size where it could pay for most of the annual debt service, the greater portion of the costs will have been paid by the city and the bonds retired. An approach based on science of a sort is now planned in determining the allocation of capital costs. This method will utilize the McIlroy analyzers and will seek to determine "influence zones" in the main networks attributable to new construction. How it will apply to the future Fullerton Plant, for example, is uncertain.

The sum total of these financial points boil down to simply the fact that for "jointly-constructed" projects for shared benefits in what is essentially a single utility system, money must come from two and sometimes more governments, not necessarily of like opinion at any given time. It is possible to delay and/or kill a project if a lump sum payment is not forthcoming. Parallel inspection of past 5-year capital programs can give examples of assumed receipts for joint ventures in one for which no corresponding payment (or at best only a token payment) appears in the other. This point need not be belabored; it exists and has been and is now a disruptive factor in regional financial coordination.

Accounting Procedures

The accounting now being carried on by the various separate utilities reflects wide variations in procedures. The principal differences are as between cash and accrual basis, depreciation, taxes, and property accounting.

Most of the utilities are on a full or a modified cash basis. Anne Arundel County is on a full accrual basis. In the case of the City of Baltimore and Baltimore County, no depreciation is recorded on any water facilities other than motor vehicles; Anne Arundel County records depreciation on all facilities, recently adding underground lines. In several utilities adequate information as to gross investment in water and sewerage properties is lacking.

Under the new Anne Arundel County Charter "enterprise accounting" on the basis of generally accepted accounting principles is required. The accrual basis of accounting is also a specific requirement as well as the recording of hypothetical ad valorem taxes in lieu of actual. These accounting requirements, properly applied, will have the effect of placing Anne Arundel's accounting on an appropriate utility basis. It would be desirable if the other utility entities adopted similar procedures.

At least in the upcoming budget, Anne Arundel's DPW is unfortunately arbitrarily setting its property tax payment to the county as a contracharge to the county's hydrant rental payment to the DPW. No attempt at setting the proper valuation and payment will apparently be made until after the elections.

Review of the accounting practices of the various utilities showed that none had written manuals of standard practices. A manual was in process of preparation for the City of Baltimore. Accounting manuals in written form for the guidance of employees should be prepared as soon as practicable.

COORDINATED
INDIVIDUAL OPERATION

COORDINATED INDIVIDUAL OPERATION

General

If it were more or less unanimously decided that the present decentralized, locally-controlled water and sewer operations were to be continued on indefinitely, no immediate adverse effects would be felt insofar as the present inhabitants of the Region are concerned. We speak in terms of their continuing to receive adequate potable water service and adequate sewage removal and treatment. In some respects, service to present inhabitants will improve, as for example when Baltimore County brings service to the 10,000-odd homes badly in need of municipal facilities, Harford County gets its watersheds developed and the Carroll County Sanitary Commission begins to attack the problem in the Sykesville area.

But in terms of future inhabitants (including, of course, industrial growth) we do not hold such an optimistic view. The water supply exists, true, but the present complicated and arbitrary pattern of negotiation, allocation and frustration will continue and grow worse.

The present financial and contractual agreements between the various political jurisdictions have long ago, in too many cases, lost all physical and equitable proportion. For every situation that is finally cleared up by reasoned argument and negotiation, more are going to be created. Within jurisdictions there is unequal and unfair treatment of customers: (for example the great spread, because of "priority of arrival", in front foot assessments in Baltimore County).

We just do not see why the citizens of this Region need to expend the dollars that we envision will be required for the talent necessary to negotiate these many and increasing points of friction from now to infinity. One cannot help an intuitive feeling that if a portion of time equal to that expended by the

extremely able gentlemen who participated in past such negotiations had been utilized in removing the causes of the differences of opinion, a very different situation would prevail today!

Make no mistake about it; the present system of operation can be continued, and even if an agreement of all parties were obtained for an immediate merger, it probably would (and should) take from 3 to 5 years for it to be consummated, considering time for legislative action, lawsuits, etc., as well as the actual merger itself.

It seems incredible to believe that an impasse in the handling of the present pattern of agreements would ever be carried out to the point of endangering the health and safety of the people due to a failure to meet demands or a curtailment of present service. At worst, the police power of the state would be evoked to prevent the latter contingency.

This Region is not unique in its problems. All over the United States, indeed the world, this type of utility problem exists and is lived with. In many locations it has been termed intolerable and has been met with resolute action, but in many cases it is in fact tolerated. The people get their water and sewer connections, generally. The inertia, bickering and petty jealousies are all too apparent and we suspect costs are higher and know that rates are unequal in most of these areas. A prime example of such a "tolerant" region is Central and North New Jersey.

The continued operation of 15-odd discrete utilities in the Baltimore Region has part of its sting removed by the mere fact that about 88% of it is in fact being operated as a physically integrated operation. While the lawyers, accountants and consultants try to clean up the debris afterwards, the interceptors generally are being built, the Susquehanna water has been brought in, etc., but at a price.

Regardless of the ultimate merits of merging, and whether or not it is going to occur, a number of suggestions aimed at improving the present organization and management of the various utilities should prove useful, if followed. If no merger ever takes place, money may be saved the present customers and/or taxpayers in the various areas. If a merger eventually occurs, the fewer weak points that each utility brings to the final organization, the better.

The suggestions referred to are presented in the remaining paragraphs of this section.

RECOMMENDATIONS

Bureau of Water Supply

Watershed Division. This Division has the responsibility for the sanitation of the Bureau's three watersheds, maintenance of access roads, fire breaks, etc; also it operates and controls the public recreation uses of the land, and the planting, nurturing and eventual harvesting of the tree cover necessary for effective watershed performance.

The land areas maintained by the watershed people are as follows:

	Total Ownership	Reservoir Area	Land Area
Liberty	9,200 Acres	3,100 Acres	6,100 Acres
Loch Raven	8,000	2,400	5,600
Pretty Boy	7,380	1,500	5,880
Total	24,580 Acres	7,000 Acres	17,580 Acres

Personnel at year end 1964 amounted to the following:

Salaried	6
Classified Per Diem	35
Laborers	25
Total	66

The division operates its own logging show, including a small sawmill. The past four years' figures for the logging and sawing enterprise have been as follows:

	Sale of Lumber	Operating Expenses	Maintenance Expenses	Net Revenue
1961	$104,096	$61,809	$5,273	$37,014
1962	76,276	61,058	4,469	10,749
1963	68,387	58,589	1,436	8,362
1964	66,589	85,170	729	(19,310)

The results have been increasingly disappointing, which must be expected as 17,000 acres do not often support even a small sawmill on a selective logging basis.

We recommend that, with the exception of the selection of the timber for cutting and the proper inspection to insure that required standards are met, the Watershed Division divest itself of all logging and lumbering duties, and that it rely instead on contracting the required thinning of the forest cover. We do not believe this function will ever again become profitable for the Bureau to conduct on its own. If it is profitable for others, some of the profit may be recaptured in competitive bidding for the cutting privileges.

We recommend that the Bureau of Water Supply explore with both State and County agencies the possibility of eventually shunting the total burden of watershed recreational and forestry operations onto an appropriate agency whose sole reason for being is forest management or recreation. It is perfectly feasible, with a minimal amount of overseeing by the Bureau, for the present level of forestry management and roads maintenance to be continued; also, the recreational possibilities of the properties could be greatly expanded in this manner, with no particular risk to present or future water supply capabilities.

Conservation Division. We recommend that this entire group be dismantled as a separate Division of the Bureau and its functions be assumed by the Distribution Division, with the exception of the maintenance of electronic control and measuring devices, which should become a part of the Supply Division (pumping and purification divisions).

With its major efforts devoted to electronic maintenance and meter setting and testing, the Division is no longer identified by its name. Even if it was solely concerned with running down leaks and wastage, this has no particular reason for being in other hands than the Distribution Division. As will be seen on Table 4, we have recommended two assistant Civil Engineers in the Maintenance and Inspection Section of the Distribution Division to help implement the hunt for unaccounted-for water. We have also shown on Table 5 three Electronic Instrument Mechanics instead of the one authorized in 1965.

Distribution Division. We recommend, as previously stated, that most of the functions of the Conservation Division be performed by this Division. We also suggest that the Meter Test and Repair Section be limited solely to that function plus assisting in the setting of large meters. We see no real reason why, on a new service, the Distribution people are competent to set the service, meter vault and yoke, but only the meter people (Conservation Division) can be relied on to set the meter. We were informed that this had been tried but the meter numbers were carelessly recorded. This is purely an operational matter, easily rectified.

We suggest too that testing of all new meters be abandoned, with only spot checks made to insure that factory specifications are adhered to. The Bureau is fortunate in that water quality is such that a meter replacement program has never been necessary. With this advantage, if new meters can also be fairly well eliminated

Table 4

CITY OF BALTIMORE
BUREAU OF WATER SUPPLY
DETAIL OF RECOMMENDED DISTRIBUTION DIVISION

PRESENT ORGANIZATION	Authorized People	1965 Appropriation
Distribution Division		
Minor Construction and Inspection		
Ceneral Superintendent of Water Distribution	1	$ 10,560
Superintendent of Water Distribution	1	7,104
Water Distribution Supervisors	2	11,208
Principal Clerk - Stenos	2	9,240
Senior Clerk - Steno	1	4,008
Engineering Aide	1	3,828
Senior Clerk - Typist	1	3,828
Senior Clerk	1	3,492
Laborers	25	125,148
Materials and Supplies	-	337,725
Total	35	516,141
Maintenance of System		
Assistant General Superintendent of Water Distribution	1	8,640
Assistant Superintendent of Water Distribution	1	6,168
Stores Supervisor	1	7,452
Chief of Survey Party	1	5,604
Water Distribution Supervisors	4	25,008
Head Clerk	1	4,404
Telephone Operator	1	3,036
Laborers	250	1,247,549
Materials and Supplies	-	381,950
Total	260	1,689,811
Conservation Division		
Superintendent of Water Distribution	1	8,640
Assistant Civil Engineer	1	6,468
Water Meter Repair Supervisor	1	6,468
Electronic Instrument Mechanic	1	5,340
Water Waste Investigator	1	5,604
Assistant Water Meter Repair Supervisor	1	5,088
Senior Engineering Aide	1	4,404
Senior Clerk - Typist	1	3,660
Senior Clerk	1	3,660
Laborers	12	57,568
Materials and Supplies	-	10,500
Total	21	117,400
Grand Total	316	$2,323,352

RECOMMENDED ORCANIZATION	Number of People	Equivalent Appropriation
Distribution Division		
Administration		
Ceneral Superintendent of Water Distribution	1	$ 10,560
Assistant Civil Engineer	1	6,468
Principal Clerk - Steno	1	4,620
Telephone Operator	1	3,036
Materials and Supplies	-	5,000
Total	4	29,684
Construction		
Superintendent of Water Distribution	1	8,640
Water Distribution Supervisors	2	11,208
Principal Clerk - Steno	1	4,620
Senior Clerk - Steno	1	4,008
Engineering Aide	1	3,828
Senior Clerk - Typist	1	3,828
Senior Clerk	1	3,492
Laborers	29	145,000
Materials and Supplies	-	336,000
Total	37	520,624
Maintenance and Inspection		
Superintendent of Water Distribution	1	8,640
Stores Supervisor	1	7,452
Assistant Civil Engineers	2	12,936
Water Waste Investigator	1	5,604
Chief of Survey Party	1	5,604
Water Distribution Supervisors	4	25,008
Head Clerk	1	4,404
Laborers	252	1,260,000
Materials and Supplies	-	382,000
Total	263	1,711,648
Meters Test and Repair		
Superintendent of Water Distribution	1	7,104
Water Meter Repair Supervisor	1	6,468
Senior Engineering Aide	1	4,404
Senior Clerk - Typist	1	3,660
Senior Clerk	1	3,660
Laborers	8	40,000
Materials and Supplies	-	8,000
Total	13	73,296
Crand Total	317	$2,335,252

from tests, this section of the Distribution Division should feel no growth pains for a number of years.

Pumping and Purification Divisions. It appears to us that a few top administrative people can be easily spared if these two Divisions were consolidated. The Pumping Division is not a remarkably necessary group to have in business as such. It will be noted on Table 5 that we have altered the titles of "Superintendent of Pumping Plants" and "Superintendent of Water Purification" to "Superintendent of Water Supply". We believe this will more accurately describe the duties of the office.

It will also be noted that we recommend merging of the Watershed Division (ex-sawmill functions) into this new Supply Division. When this is done, the operation aspect of providing potable water at the master venturi and getting it from there to the customer will be separated into the two distinct functions of supply and distribution.

Engineering and Plant Improvement Divisions. We recommend that these two groups be merged into one Engineering Division. This could have the following beneficial effects:

(a) Workload between design, review of consultants' designs and construction administration can be more evenly balanced without variations in staff - presuming that the engineering personnel are that versatile.

(b) Essential contact between those charged with design and those charged with construction administration can be encouraged.

(c) Some beneficial realignment in position classifications can be made because of the merger.

Table 5

CITY OF BALTIMORE
BUREAU OF WATER SUPPLY
DETAIL OF RECOMMENDED SUPPLY DIVISION

PRESENT ORGANIZATION

Purification Division	Authorized People	1965 Appropriation
Plant Operation		
General Superintendent of Water Purification	1	$ 10,044
Assistant General Superintendent of Water Purification	1	7,452
Superintendent of Water Purification	2	16,044
Senior Chemists	2	12,936
Chemist	1	5,880
Senior Microbiologists	2	12,936
Senior Clerk - Steno	1	4,848
Senior Clerk - Typist	1	4,620
Laboratory Aide	1	2,760
Laborers	60	302,503
Materials and Supplies	-	348,425
Total	72	728,448
Structures Maintenance		
Maintenance Mechanic Foreman	1	5,880
Laborers	22	112,779
Materials and Supplies	-	66,000
Total	23	184,659
Watershed Division		
Superintendent of Watersheds	1	10,044
Watershed Forester	1	6,468
Assistant Superintendent of Watersheds	1	7,824
Watershed Maintenance Supervisors	2	12,984
Principal Clerk	1	5,088
Sanitary Inspection of Watersheds	1	4,620
Laborers	60	300,876
Materials and Supplies	-	116,900
Total	67	464,804
Pumping Division		
Operation		
Superintendent of Pumping Plants	1	9,552
Assistant Superintendent of Pumping Plants	1	7,104
Principal Clerk - Steno	1	4,620
Senior Electric Pump Operators	5	25,224
Electric Pump Operators	21	86,208
Materials and Supplies	-	473,500
Total	29	606,208
Maintenance		
Superintendent of Electrical - Mechanical Equipment	1	7,452
Maintenance Mechanic Foreman	1	6,168
Oilers	9	34,092
Maintenance Mechanics	3	13,656
Materials and Supplies	-	20,000
Total	14	81,368
Grand Total	205	$2,065,487

RECOMMENDED ORGANIZATION

Supply Division	Number of People	Equivalent Appropriation
Administration		
General Superintendent of Water Supply	1	$ 10,044
Assistant Superintendent of Water Supply	1	7,104
Watershed Forester	1	6,468
Senior Clerk - Steno	1	4,848
Senior Clerk - Typist	1	4,620
Materials and Supplies	-	3,000
Total	5	36,084
Quality Control		
Senior Chemists	2	12,936
Chemist	1	5,880
Senior Microbiologists	2	12,936
Sanitary Inspector of Watersheds	1	2,760
Laboratory Aide	1	4,620
Materials and Supplies	-	10,000
Total	7	49,132
Plant Operation		
Superintendent of Water Supply	2	16,044
Principal Clerk - Steno	1	4,620
Oilers	9	34,092
Senior Electric Pump Operators	5	25,224
Electric Pump Operators	21	86,208
Laborers	60	302,503
Materials and Supplies	-	808,925
Total	98	1,277,616
Maintenance		
Superintendent of Water Supply	1	9,552
Superintendent of Electrical - Mechanical Equipment	1	7,452
Watershed Maintenance Supervisor	1	6,492
Maintenance Mechanic Foremen	2	12,048
Electronic Instrument Mechanics	3	16,020
Maintenance Mechanics	3	13,656
Principal Clerk	1	5,088
Laborers	67	335,000
Materials and Supplies	-	202,900
Total	79	608,208
Grand Total	189	$1,971,040

Table 6 shows our recommended staffing of the Engineering Division.

Consumer Service Division. We have no reorganization of this group to suggest, but we offer a major procedural change in the later section of this report covering data processing. This is the introduction of mark-sensing meter reading which will help contribute to the over-all reduction in data processing personnel (covered in that section) and should allow a possible elimination of 10 clerks in Consumer Service, as checking of subtractions disappears.

A singularity of this kind of municipal organization shows up when one considers the meter-reading function. Ordinarily meter readers are a part of customer accounting; other than making note of broken or leaking meters they do not have any contact with the operating side of the business. In the Bureau, however, there is no "accounting" as such, except "water volume accounting.". But the city accounting people in the municipal building do not want the administration of 35 meter readers so the latter form nearly half of the Consumer Service Division. There is no better way to arrange this under the present Bureau system.

Division of Executive Direction. There is a likelihood that the authorized Principal Engineer and Senior Civil Engineer might be more properly placed in, say, the Engineering Division. The final direction of the Bureau is in the Administrative offices of the Department of Public Works. Thus a Bureau Chief and Assistant Bureau Chief, plus Administrative Assistant and Rate Analyst along with sufficient clerical help, should serve to head up the operations of Water Supply. (We have not shown this in Table 6.)

We recommend that each budget not regularly indicate $6,000 for the services of a consultant; if one is required, funds may be obtained in advance for that particular instance. A year or two may go by without the need for general consultation.

Table 6

CITY OF BALTIMORE
BUREAU OF WATER SUPPLY
DETAIL OF RECOMMENDED ENGINEERING DIVISION

PRESENT ORGANIZATION

Engineering Division	Authorized People	1965 Appropriation
Principal Engineer	1	$ 10,044
Civil Engineer	1	8,640
Assistant Civil Engineer	1	6,168
Survey and Project Supervisors	2	13,920
Senior Engineering Draftsman	1	7,104
Engineering Draftsman	1	5,604
Senior Draftsmen	2	9,696
Chief of Survey Party	1	5,604
Senior Engineering Aides	4	18,048
Draftsmen	2	10,224
Senior Clerk - Steno	1	4,848
Drafting Aides	2	7,656
Engineering Aides	2	7,656
Materials and Supplies	-	4,450
Total	21	$119,662
Plant Improvement Division (Loan Funds)		
Water Plant Improvement Supervisor	1	$ 10,444
Superintendent of Inspection - Sewer/Water	1	9,952
Civil Engineers	3	22,828
Assistant Civil Engineer	1	6,168
Principal Inspectors - Sewer/Water	3	23,948
Surveys and Projects Supervisor	1	5,880
Engineering Draftsman	1	7,104
Chief of Survey Party	6	35,752
Senior Inspector - Sewer/Water	7	46,272
Inspector - Sewer/Water	1	5,604
Senior Construction Inspector	1	5,020
Inspector - Sewer/Water	1	5,740
Principal Clerk - Steno	1	4,620
Senior Engineering Aide	2	10,224
Draftsman	1	4,404
Engineering Aides	4	16,864
Drafting Aide	1	4,008
Overtime	-	10,000
Total	36	$234,832
Grand Total	57	$354,494

RECOMMENDED ORGANIZATION

Engineering Division	Number of People	Equivalent Appropriation
Administration		
Principal Engineer	1	$ 10,044
Principal Clerk - Steno	1	4,620
Senior Clerk	1	3,492
Materials and Supplies	-	450
Total	3	$ 18,606
Design and Construction		
Civil Engineers	3	$ 22,828
Assistant Civil Engineers	3	18,504
Senior Clerk - Stenos	2	9,696
Survey and Project Supervisors	2	13,920
Chief of Survey Party	6	35,752
Senior Engineering Aides	6	28,272
Engineering Aides	6	24,520
Superintendent of Inspection - Sewer/Water	1	9,952
Principal Inspectors - Sewer/Water	3	23,948
Senior Inspectors - Sewer/Water	5	33,050
Inspector - Sewer/Water	6	33,624
Overtime	-	10,000
Materials and Supplies	-	3,000
Total	43	$267,066
Records and Drafting		
Senior Engineering Draftsman	1	$ 7,104
Engineering Draftsmen	2	12,708
Senior Draftsmen	2	9,696
Draftsmen	3	14,628
Drafting Aides	3	11,664
Materials and Supplies	-	1,000
Total	11	$ 56,800
Planning and Development		
Civil Engineer	1	$ 8,640
Assistant Civil Engineer	1	6,168
Senior Engineering Aide	1	5,112
Total	3	$ 19,920
Grand Total	60	$362,392

Effect of Changes - Summary

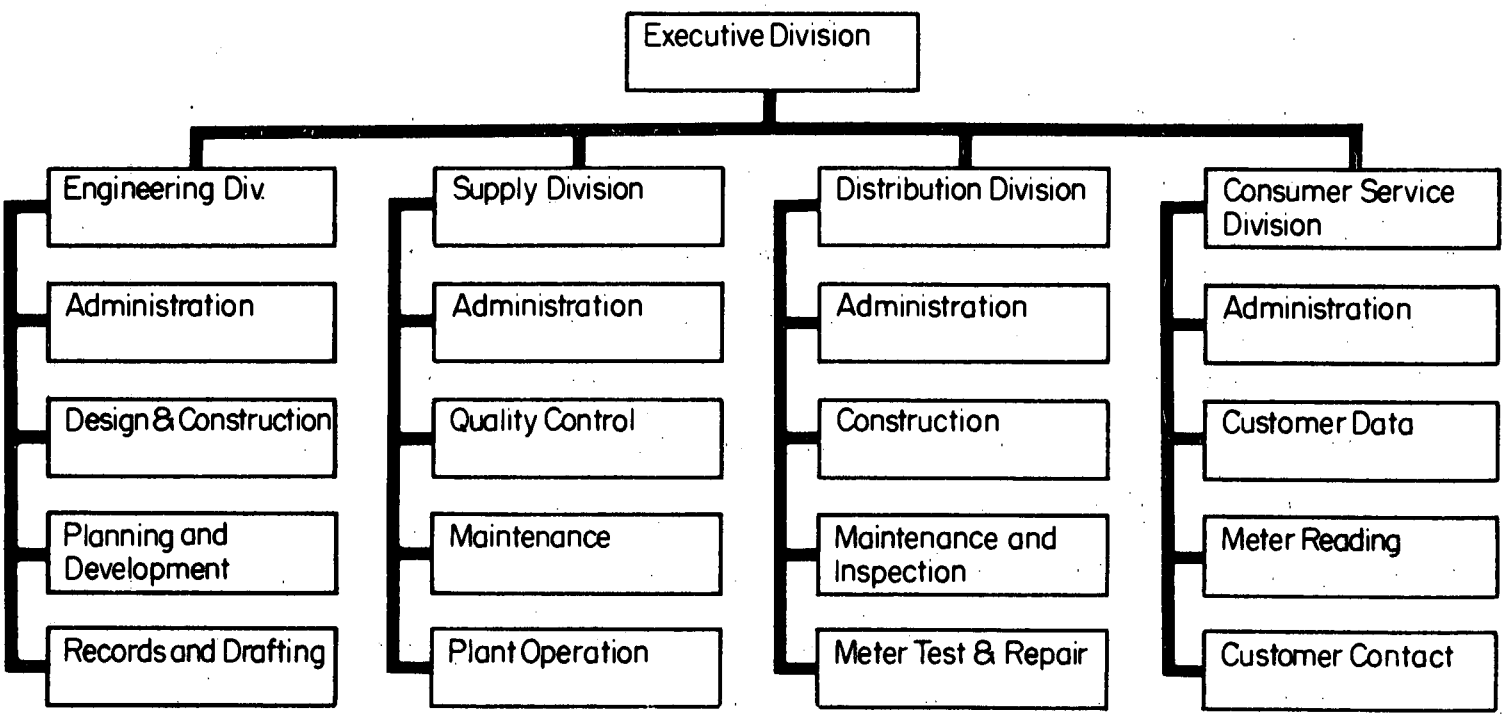
Division	Increased (Decreased) Salaried Personnel	Laborers	Expense
Executive	-	-	$ (6,000)
Engineering	3	-	7,898
Supply	(1)	(15)	(94,447)
Distribution	(1)	2	11,900
Consumer Service	(16)	-	(59,552)
Total	(15)	(13)	$(140,201)

We have of necessity in this type of analysis exercised our knowledge of water operations in general and made the blanket assumption that (a) those holding a title are in fact that type of person, and (b) are capable of performing the type of job indicated by the title. We know that in some cases (a) is not correct; a roster may show an Assistant Civil Engineer who is really an accountant because an accountant was needed, the position was vacant and the salary was right. We must operate here under the assumption that (b) is correct, even if we know in some cases it may not be. Bearing in mind the scope of our assignment, it will be realized that these conclusions are reasonable and general, not absolutely firm and not capable of uncontrovertible proof. A full workload, office procedure and job analysis study should follow up and confirm these recommendations. (It should be emphasized that if indeed all these people are capable of the assignments indicated by their titles, some of them are working at a very low salary.)

We have assumed that the figures in the 1965 appropriation, divided by $5,000, will give the approximate number of laborers in a given group. Where we have been able to check this assumption, it seems quite accurate.

Chart 9

City of Baltimore
Recommended Organization of Bureau of Water Supply



Baltimore City Metering Program

The 1953 Report of the Board of Advisory Engineers on Future Water Supply stated that it would cost $8,224,000 to convert the then 127,350 small unmetered service. This is a unit cost of $64.73.

The Weber, Fick & Wilson Waterworks indices for meters were 401.0 at December 1953 and 565.8 at December of 1964, an increase of 41.1%. Comparable indices for labor (ENR) went up 71.3% in the same period and for steel services the increase was 60.9%. The increase in unit cost for this program will be assumed at the lower of the three figures, 41.1%, and would be $26.60 or a total at present of $91.33 per service. This cost agrees in magnitude with what can be garnered from the Department of Public Works Reports on the cost of a meter and service.

The average number of nonmetered accounts in the year 1963 was 99,700. Taking the unit conversion cost of $91.33, the total cost for immediate conversion would be $9,105,600. Annual costs over a 20-year life would be as follows, assuming 4% interest.

Capital Recovery

Straight-Line Depreciation	@ 5.00%	$ 455,300
Average Annual Interest	@ 2.10%	191,200

Maintenance

Meter Repairs	@ $3.68/meter	366,900

Meter Reading

Direct Cost	@ $0.90/meter	89,700
Total Annual Cost		$1,103,100

(Billing and collecting expenses are omitted as being reasonably the same for both metered and unmetered customers.)

This is a faulty cost analysis to the degree that almost all of the meters installed would be new and therefore should by no means require the average level of present meter repair costs, until a good portion of the assumed 20-year life span has passed.

The 1962 DPW report states that a spot check of 200 converted accounts indicates an annual revenue increase from $20.02 to $22.10, or $2.08. On this basis, 99,700 accounts would return $207,400 additional per year, clearly a losing proposition.

Another analysis could be made using average billings from the 1962 report. In Baltimore City, 14.5% of 5/8" meters were on the minimum of $10.00, with the reminder averaging $28.11. If the converted 99,700 services behaved in this same average manner, we could expect the following return:

on minimum:	14.5% x 99,700 x $10.00	=	$ 144,600
on blocks:	85.5% x 99,700 x $28.11	=	2,396,200
		Total	$2,540,800
Less: present average unmetered revenue			1,744,000
Net Increase in Revenues			$ 796,800

There is no reason to believe that these figures are too much more accurate than the 200 sample accounts, but they at least cover a broader base. We may, however, postulate that, omitting the volumetric saving in water treatment and pumping costs, (and any absolute figure placed as a value on the water itself) the city could save something like $500,000 per year at a cost of something like $1,000,000 per year if it converted its 100,000 nonmetered accounts. On the surface it seems as if there is no reason for the Bureau of Water Supply to accelerate its present program of about 3,000 conversions a year.

Regarding our statement above on placing an absolute value on the water itself: - The situation of New York City, where rampant losses may or may not go hand

in hand with rampant flat rate use, does not obtain in the Baltimore Region. There does not seem to be the possibility of a physical water shortage, so that what is going to waste due to a block of flat rate customers is not contributing to a shortage. Obviously the lack of 100% metering makes leak estimation inaccurate. But with no shortage, it seems as though ordinary economics should govern.

Bureau of Sewers

Storm Drains

We recommend that the Bureau of Sewers responsibility for storm water drainage work be transferred in its entirety to the Bureau of Highways. This would bring the organization of the Department of Public Works more in line with what we believe is the common method of handling storm drainage work. The growing administrative and financial impact of Federal and State assistance in urban highway work, including attendant drainage, is such that some control improvements could be realized. The skills involved are no barrier to such a shift. It is possible too that operating efficiency may be improved if the drainage maintenance crews were decentralized into the Bureau of Highways yards.

Engineering Division

In a similar manner as was done for the Bureau of Water Supply, Table 7 presents a reorganized Engineering Division. The numbers of people deemed necessary to carry out planning, engineering, drafting and design, survey work, contract administration and inspection are indicated in the right-hand column. Some new people have been added, (aides and clerical help) and the balance, representing those people occupied in storm drain work, have been assumed transferred to the Bureau of Highways. This transfer removes 18 people and the sum of $137,636 (including $20,000 of overtime).

Table 7

CITY OF BALTIMORE
BUREAU OF SEWERS
DETAIL OF RECOMMENDED ENGINEERING DIVISION

PRESENT ORGANIZATION	Authorized People	1965 Appropriation
Construction Work		
Principal Engineer	1	$ 10,560
Civil Engineer	3	20,988
Assistant Civil Engineer	5	30,840
Superintendent of Inspection - Sewer/Water	1	7,824
Principal Inspector - Sewer/Water	4	26,808
Chief of Survey Party	1	5,604
Senior Engineering Draftsman	2	13,884
Engineering Draftsman	2	11,208
Senior Draftsman	2	9,696
Inspector - Sewer/Water	1	5,088
Senior Engineering Aide	1	4,620
Draftsman	2	8,808
Engineering Aide	1	4,008
Inspecting Aide	1	3,828
Laborers	2	8,742
Overtime	-	60,000
Materials and Supplies	-	45,200
Total	29	$277,706
Construction (Loan Funds)		
Principal Engineer	1	$ 9,552
General Superintendent of Sewers	1	8,640
Senior Civil Engineer	5	45,612
Senior Electrical Engineer	1	10,044
Senior Mechanical Engineer	3	26,904
Superintendent of Inspection - Sewer/Water	1	8,640
Civil Engineer	1	8,640
Superintendent of Construction	1	8,220
Surveys and Projects Supervisor	1	7,452
Engineering Draftsman	1	6,168
Chief of Survey Party	6	37,944
Senior Inspector - Sewer/Water	7	42,960
Senior Draftsman	2	10,692
Inspector - Sewer/Water	4	22,272
Senior Engineering Aide	4	18,264
Draftsman	1	4,404
Engineering Aide	1	4,848
Drafting Aide	3	11,664
Overtime	-	3,800
Total	44	$296,720
Grand Total	73	$574,426

RECOMMENDED ORGANIZATION	Number of People	Equivalent Appropriation
Engineering Division		
Administration		
Principal Engineer	1	$ 10,560
Principal Clerk-Steno	1	5,340
Senior Clerk-Steno	1	4,014
Materials and Supplies	-	3,000
Total	3	$ 22,914
Design and Construction		
Principal Engineer	1	$ 9,552
Senior Civil Engineer	2	18,245
Senior Electrical Engineer	1	10,004
Senior Mechanical Engineer	3	26,904
Civil Engineer	2	13,993
Assistant Civil Engineer	2	12,236
Surveys and Projects Supervisor	1	7,452
Chief of Survey Party	5	31,105
Senior Engineering Aide	5	22,885
Engineering Aides	5	24,240
Superintendent of Inspection - Sewer/Water	1	8,640
Principal Inspector - Sewer/Water	3	20,106
Senior Inspector - Sewer/Water	5	30,685
Inspector- Sewer/Water	3	16,416
Inspecting Aide	1	3,828
Senior Clerk-Stenos	2	9,696
Overtime	-	40,000
Materials and Supplies	-	41,200
Total	42	$347,187
Records and Drafting		
Assistant Civil Engineer	1	$ 6,168
Senior Engineering Draftsman	2	13,884
Engineering Draftsman	2	11,584
Senior Draftsman	3	15,291
Draftsman	2	8,808
Drafting Aide	2	7,776
Materials and Supplies	-	1,000
Total	12	$ 64,511
Planning and Development		
Civil Engineer	1	$ 8,640
Assistant Civil Engineer	1	6,168
Engineering Aide	1	4,008
Total	3	$ 18,816
Grand Total	60	$453,428

Other

We would tend to recommend that Pumping Stations and Treatment Plants be grouped into one administrative unit entitled, say, the "Plant Division". Possibly at the time of some future retirements a few administrative positions could be abolished, but we have not assumed any such savings in this report.

Both in the Bureau of Sewers and Water Supply we recommend most emphatically that no engineering except consultant work be paid for out of loan funds; all regular city employees belong in the regular annual appropriation from general funds. This mingling of fund sources, as it is currently handled, makes it difficult to staff for a steady work load and use consultants for peak loads. It seems that the loan-paid staff is subject to hiring and firing spurts, and they should not be.

We have no further organizational changes to offer concerning this Bureau.

Effect of Changes - Summary

Division	Increased (Decreased) Personnel	Expense
Executive	-	$ (6,000)
Engineering	(13)	(120,998)
Other	(93)	(465,000)
Total	(106)	$(591,998)
Picked up in Highways	111	$ 602,637
Net Total	5	$ 10,639

It will be apparent to all that we have found a way to increase total expense by this move. This apparent increase is because the scope of our report does not extend to the Bureau of Highways and also because, once we determined that we do not believe storm drain work should be in the Bureau of Sewers, we made no attempt to effect economies in that operation. Whether the 106 people transferred will be assimilated in total by that other Bureau remains for others to determine.

Baltimore County Department of Public Works

We do not offer any organizational changes for the segments of the County DPW that operate under the Metropolitan District funds. We have several accounting-financial suggestions to make, however.

We recommend that the 21 people in the Department of Permits and Licenses who are charged to the Metropolitan Construction fund be assigned elsewhere. This does not appear a fair charge against water and sewer revenues. It also appears that an equivalent of 95 people in the Bureau of Engineering charged to the same fund does not equate to the number of people whose time is primarily engaged in planning, design and engineering of water and sewer work. This is about 48% of the total number in the Bureau of Engineering.

These corrections, if accomplished, would not save a nickel, except for the customers using Metropolitan District services. The general taxpayer would pick up the cost in other funds.

We further recommend that the existing system of obtaining revenues from sewer and water customers be utterly abandoned and a rate schedule more in accord with those of regulated investor-owned utilities be adopted. There could and no doubt would be hundreds of spot inequities in such a change. But so are there now in the present system, which gives every indication of being beyond the bounds of treating all customers equitably. A set of charges that recognizes the inherent equality of all present users of a service and also gives them some control over the amount by their control over the use should receive the favorable vote of most residents.

The Baltimore County Executive has been quoted as expressing disfavor with the present system and has charged a committee to investigate other methods of financing utility operations and expansion. We agree with him in this step.

A total of 13 people in the Office of Finance are currently engaged in figuring the various assessments for utility customers. We do not refer to those people as a possible saving elsewhere in this chapter of the report, but they would, of course, disappear once a commodity charge rate were introduced. We do postulate their removal under possible merger, discussed later in this report.

Uniform Accounting

We believe that some future benefits will be obtained if each separate operating utility moved to adopt a more standardized cost accounting system based on generally accepted accounting principles. Adoption of such a system, while probably not abolishing fund accounting, would produce reliable financial data that should facilitate debt financing.

It would also allow easier comparisons of relative costs and efficiencies. It could aid the sometime imposition of a uniform water and sewer commodity charge. It would be of definite assistance in negotiating future contract changes if each party thoroughly understood the accounting systems of the other.

Centralized Billing

This innovation by no means requires the physical merger of the several utilities. A completely repetitive routine assignment such as periodic water and sewer use billing could be automated by a jointly owned central machine room to an extent that at least $40,000 per year could be saved over the present systems. The existence of a multitude of rates and assessment schedules would be no impediment to such a center; the data on each customer would be provided to the center and would be programmed into the memory banks.

Uniform Construction Standards

It might be thought that the laying of water and sewer lines would not be conducive to too wide variation in the construction methods and materials used.

This is not really the case; it is possible to find occasional radical variations in design philosophy and construction standards. In a good many cases the variance must be made due to abnormal topographical conditions or sewage composition. In some instances it is due to design by varying consultants. We would suggest that even under a decision to continue separate operations, considerable future savings might possibly accrue to the ratepayers if a deliberate attempt were made now to effect a closer degree of construction standardization. These savings can come about in two ways:

1. Regardless of present determinations to maintain the status quo, the future could bring about a general consolidation at any time. Sizeable savings in material inventories can be had at that time, future purchases could be made in economic volume and the skills of service and maintenance men would be much more uniform, allowing flexibility of personnel assignment.
2. It is highly probable that a careful study of present standards and costs would show that some utilities are doing things in a more expensive manner for no particular reason. This information is not now regularly available among the Region's utilities.

We recommend that each water and sewer utility assign a man from design and a man from construction or maintenance first to work up a lucid set of their <u>own</u> construction and design standards and then to bring these standards to a regular meeting of a regional committee where it is hoped a uniform set can be established. (Arguments as to size of present plant investment and levels of present inventory should have no bearing on final decisions.)

Physical Facilities

A number of improvements should be made in the offices of the utilities that we visited.

Bureau of Water Supply-Park Terminal. This building has extensive office area on the second floor, now only about half-occupied (or less) by the Distribution Division. The building is sound and in all respects, except modernity and parking, suitable for office usage. It would greatly increase appearance and could help efficiency if the occupied offices and hallways were relighted and repainted.

The real defect of this building, affecting field as well as office personnel, is its lack of personal parking. All employees must find parking on the street, which has resulted in occasional vandalism and in apprehension on the part of female employees. The area is not apparently the best in terms of residents. The Bureau has attempted without success to buy from the Bureau of Parks a small triangular piece of Druid Hill Park just across the street to the north of Park Terminal. This plot, of something under an acre, is not of much benefit to the people, being cut off from the balance of Druid Hill by Auchintolery Terrace and Swan Drive, and has been allowed to deteriorate.

Further efforts should be made to acquire this parking space. Failing this, consideration should be given to permitting women employees to park within the building in space vacated by trucks. Since there are only two or three people involved this can be done.

Ashburton Offices. These offices, on the second floor of the Ashburton Filtration Plant, house all Bureau of Water Supply Divisions except Distribution and Watersheds. They are quite good offices, air-conditioned and cheerful, but are not too well utilized. We would estimate that if individual offices, clerical

areas and conference rooms were reduced to "normal" size, approximately double the number of current, full-time inhabitants could be accommodated. (A number of people merely touch base here and spend the major portion of the day in the field.)

The geometry of the floor is a U shape, with a connecting corridor, storage space and one suite of offices across the open end. One arrives at the visitor's parking area in front of the building, traverses a tiled lobby and mounts a handsome staircase to one end of the U. This two-story foyer area is complete with mural and clear-water viewing shaft in the finest tradition of public water plant architecture. (Unfortunately the lighting of the tube does not function.)

Immediately off the second floor balcony is the telephone operator-receptionist and a very large waiting area. At one end of the waiting area are several interview booths, unused, that were intended as spots for hearing customers complaints. The first office area is assigned to the Consumer Service Division. It appears as though the section of the Division devoted to meter-reading operations comes first and must be passed through by citizens desiring the section devoted to customer contact. These two groups should be reversed.

If the visitor wishes to see the executives of the Bureau (and is not well enough informed to drive around to the rear parking lot and use the rear stairs), he will be directed across the connecting hall to the opposite end of the U. The previous Water Engineer desired this isolated position as a buffer against the occasional crank visitor. In our opinion, given this particular floor shape, the executive offices should be more accessible to the front or main entrance, directly after the Consumer Service people, possibly in the base of the U now occupied by a portion of the Engineering Division.

The two McIlroy network analyzers would be expensive to move and must be left where they are. We think it might be well to place Engineering further to

the rear and around the corner, utilizing the space now held by the Conservation and Plant Improvement Divisions. The remainder of the rear wing would house the Supply Division. During these moves the overly generous working spaces should be reduced. It would be cheaper in the long run to spend a reasonable amount on decor, partitions and rugs than it is to indicate rank by such large offices. Those areas not actually occupied should be left bare and vacant. (From the point of view of the Bureau of Water Supply this may be merely inviting shared use with some other City group now bulging at the seams. But economy is just that, and perhaps this shared view should be encouraged.)

County Office Building-Towson. The space occupied by the Engineering Bureau of the Department of Public Works is extremely poor. Approximately 60 men and women occupy what is essentially a large open bullpen with no semblance of section or group delineation except where one desk or table ends and the next begins. A conference area exists and the Bureau Chief and Assistant and secretary have private offices.

By visual observation and by query we determined that a significant portion of the engineers' day is used up in the frustrations of lack of storage and filing space, of being too accessible to everyone with a petty question and by the lack of competent clerical and aide personnel to absorb the routine and nonengineering chores.

We recommend that some of the people in this area be removed and relocated elsewhere (of necessity in the building) and that both old and new areas be sensibly divided into partitioned sections corresponding to organizational and functional grouping.

The importance of the work done in this Bureau, the value of the investment decisions made and works designed and the simple total of the payroll involved

warrant decent quarters for the people. It may not be only salary deficiencies that deter the young engineering graduate from accepting a position in the Bureau.

In marked contrast to this hive is the ordered quiet of the head offices of the Bureau of Utilities, in the same building. The problem here, however, is often the time lost in running papers back and forth to the adjacent Jefferson Building, where quarters are rented for the Personnel and Central Service Bureaus. (One particular routine item, a budget sub-order release, must make four trips between the two buildings.) We have no answer to this problem other than the blunt suggestion (similar to the previous one in Engineering) that better quarters be found for everyone. The rented quarters adjacent to Baltimore County's office building very accurately reflect the rapid growth that the County has experienced in recent years.

Bureau of Sewers - Franklin Street Yard. The Bureau has been criticized by various people for not decentralizing its yard at Franklin Street and Calverton Road. It has attempted in the past to station two crews at the Bureau of Transportation's Guy Street Yard but without too much success, as staffing of labor was so thin that normal sick calls and vacation absences prohibited normal operation; the flexibility in manpower available at a large yard did not exist.

Apparently the road network serving the Franklin Street yard is not too bad and in the opinion of the Superintendent no excessive amount of time is lost. We are not wholly convinced of this. It would seem worthwhile to institute a study designed to determine whether or not one third of the Franklin Street yard might not be profitably sited at the Back River Plant (even though it is about two road miles outside the city limits) or the Montebello Filter Plant of the Bureau of Water Supply.

The office-garage-storeroom structure at the Franklin Street yard is only two years old and is a well-designed, well-maintained building. Some of the other sheds and buildings on the site are quite shabby and decrepit. Replacement plans are being made which should include a complete repaving job. The present surface of the yard presents a hazardous condition for moving equipment.

City Municipal Office Building. The spaces occupied by the Bureau of Sewers are quite adequate for the office operation of the Bureau.

Establishment of a Coordinating Committee

Considering the deficiencies of the present mode of doing business, it should be obvious that future planning of utilities, land use, and other related elements must be better coordinated. A good many of the past problems would be vastly eased if this could be done. It appears to us that this can only be accomplished by the involvement of top men of the utilities in the comprehensive planning process.

We recommend that a coordinating body be formed to assist in guiding the future utility capital expenditures of the Region into the dovetailing that is necessary when, as at present, one body may finance and construct for another. This body should be formed of the top utility men and the top financial man of each jurisdiction. If Baltimore were the only city in the group, this would mean a 12-man membership. In order to coordinate utility development with other aspects of urban development, the body would be constituted as the utility coordinating committee of a council of local governing officials, as required by the U.S. Department of Housing and Urban Development. (See Appendix A)

Future requirements should be worked up by each unit, both in physical quanitities as well as dollars, up to 10 or 15 years in advance. (This budgeting

may omit distribution facilities and other local responsibilities.) Disagreement as to contributions from each party must be handled by previously agreed-upon convention. Major disagreement between two bodies could be adjusted by a mutually accepted voting procedure. A requirement of this long-range capital estimating would be that the several six-year capital budgets faithfully include the identical items. If each succeeding annual budget does not agree and provide the required items at the required time, of course the idea fails.

In order for this system to work, local governments must agree to be guided in their utility programming by Regional Planning Council recommendations developed through a mutually agreed-upon set of procedures. Effective control would have to be exercised by each political unit in such ways as in sending its own representatives to the table with well-justified requirements. Poverty cannot be used as an excuse. If the requirement for service is there, the money must be raised.

We do not advance this method of getting together with great estimation of its instant success. Mutual resolve on the part of all participants to make it succeed will be necessary. It is, however, an attendent must if all the utilities go it alone in the future. The growth of the Region calls for more and more decisions on utility policy and capital expenditure to be made in a Regional context, disregarding present political boundaries. The manner of making these decisions must be improved.

Summary of Savings

Through very conservative estimating we conclude that if the foregoing recommendations are adopted, minimum annual savings of the amounts shown below can be obtained.

Gross Water - Sewer Savings	$897,000
Functions Picked Up in Other Groups	(726,000)
Net Water - Sewer Savings	$171,000

This estimate omits any savings stemming from improvements in general accounting, equipment maintenance, space utilization, abolishing assessment work, general efficiency of employees and regional coordination. It must be assumed that some further monetary benefits would be possible in these fields.

Discussion

Most of this past section on individual utility improvement dealt with rather prosaic organizational changes such as the merging of too-fragmented sections within an existing bureau or shedding some functions that do not seem well situated under the wing of water and sewer operations.

Baltimore City and Baltimore County received all of the comments for the simple reason that they control by far the greatest proportion of utility assets and employees. Anne Arundel County is really large enough to be included but it being in the throes of its own reorganization, it seems pointless to dwell on shortcomings of an operation which is being substantially changed.

The City of Baltimore has had a long time to build up an encrustation of inefficiencies. Only a portion of this inertia and red tape can be cut away by an interior reorganization of the Bureaus of Sewer and Water Supply. The top level of the DPW and other city Departments and Bureaus and most particular the municipal civil service require sprucing up before all possible organizational, operational and financial benefits could be obtained for the paying customer of sewer and water services.

By no means do we wish to imply that responsible officials in the city are unaware of the situation or are doing nothing about it. In this report we mention steps being taken or proposed to reorganize the DPW, improve accounting, etc. Nevertheless we must give as our judgment that the water/sewer picture can

only be slightly improved, compared to its potential, while the present functional city organization is maintained.

Baltimore County is in the somewhat different position of being a rapidly-growing area, and its problems regarding inefficiency may be more accurately thought of as stemming from an ever-mounting volume of work rather than lethargy. It has also had several organizational changes of varying magnitude in the moderately recent past. These have tended to cut down on the possible comments we could make that do not bear on rates and personnel allocated to the metropolitan funds.

The very small utilities offer no opportunity for comment on the level we are dealing with. It is difficult to reorganize and refinance commissions of this type, operated as they are under state statute. Their small size and short life have also been a factor in not permitting too many areas of inefficiency to flourish.

COMBINED OPERATIONS

PART I - COMPLETE COMBINATION

General

The obvious, if not the only, alternative to a continued status quo operation is a combination of utilities in some form or other to some degree or other. The two major report headings under which we shall divide the possibilities are Complete Combination and Partial Combination. The latter category could have almost an infinite choice of possibilities; we will of course reduce the number for purposes of discussion here.

Two versions of "complete" integration are possible. One is the combination of the seven major utilities in the Region, corresponding to the six political bodies making up the Regional Planning Council: the water and sewer components (including ancillary accounting-billing functions) of the following organizations:

Anne Arundel County DPW
Baltimore County DPW-Metropolitan District
Carroll County Sanitary Commission
City of Baltimore DPW
Harford County Metropolitan Commission
Howard County Metropolitan Commission

The second version is the above utilities plus all the others, municipal and private. This could be thought of as a second stage of accomplishing a complete merger.

Reason for a Merger

It may be safely stated that mergers take place for sensible reasons. Those most often advanced, which are also those with the largest import, are as follows:

1. The same (or an improved) job can be done at significant reductions in total over-all cost.

2. The job to be done in the future is growing beyond the individual capabilities of the individual groups due to technical, financial or managerial reasons.

3. The physical resources required for future expansion are concentrated in the hands of one of the individual bodies.

4. The individual groups find that required cooperation and coordination is becoming increasingly complicated and uncertain.

We believe that all four reasons are pertinent to the situation obtaining in the Baltimore Region and that a study of the merits of a water and sewer utility merger is a matter of utmost importance to the governing bodies of the area.

Complete Water-Sewer Consolidation

Obviously, if any merger of water and sewer utilities is to be studied under the aegis of the Regional Planning Council, one of the possible merger patterns should be all those utilities in the Council's area of operation, namely Anne Arundel, Baltimore, Carroll, Harford and Howard Counties and the City of Baltimore. Logically included in the area, though not now under the control of the political bodies enumerated, would be the several municipal and private water and sewer systems.

This particular grouping, while on the surface perhaps appearing as though it were only because of the present geographical makeup of the Regional Planning Council, carries a good deal of logic to it, as perusal of a map will show.

Considering geography and topography, the Region is not markedly divided into dissimilar sections. The long-range water supply of the Region is generally going to be the city's watersheds plus the Susquehanna aqueduct system. In terms

of population, the Region essentially comprises the area of this part of the state that will require municipal sanitary services for the foreseeable future, and this population is tied together economically and culturally by the existence of a major city at its approximate center.

One Utility Or Two?

Of equal importance with the question of how many separate components go into a merger is the question, "should both sewer and water operations be merged into one utility, into two separate utilities, or should only one or the other be merged?"

The largest two utilities (in Baltimore City) are now operationally separate. The second (Baltimore County) is semi-separated and the third (Anne Arundel County) is integrated.

On the whole it would seem that an operation that would encompass both water and sewer would be more efficient since in the overhead departments most of the accounting and some of the engineering (maps, records, duplicating, surveys, etc.) could do double duty with a much better use factor than the comparable two separate utilities would have.

As far as the Region is concerned, neither sewer nor water is more markedly free of problems than the other. In many of the area's trouble spots the two are equally prominent and are interlaced. In the mind of the general public the sewer difficulties probably bulk larger because of stream and bay pollution, septic system troubles and the attendant national publicity.

Where hiring, salary and morale problems exist, they exist equally in the water and sewer phases. On the whole, we believe that the Region would be best served by considering the two as organizationally and financially one for the purposes of this particular discussion.

Organization of Amalgamated Utility

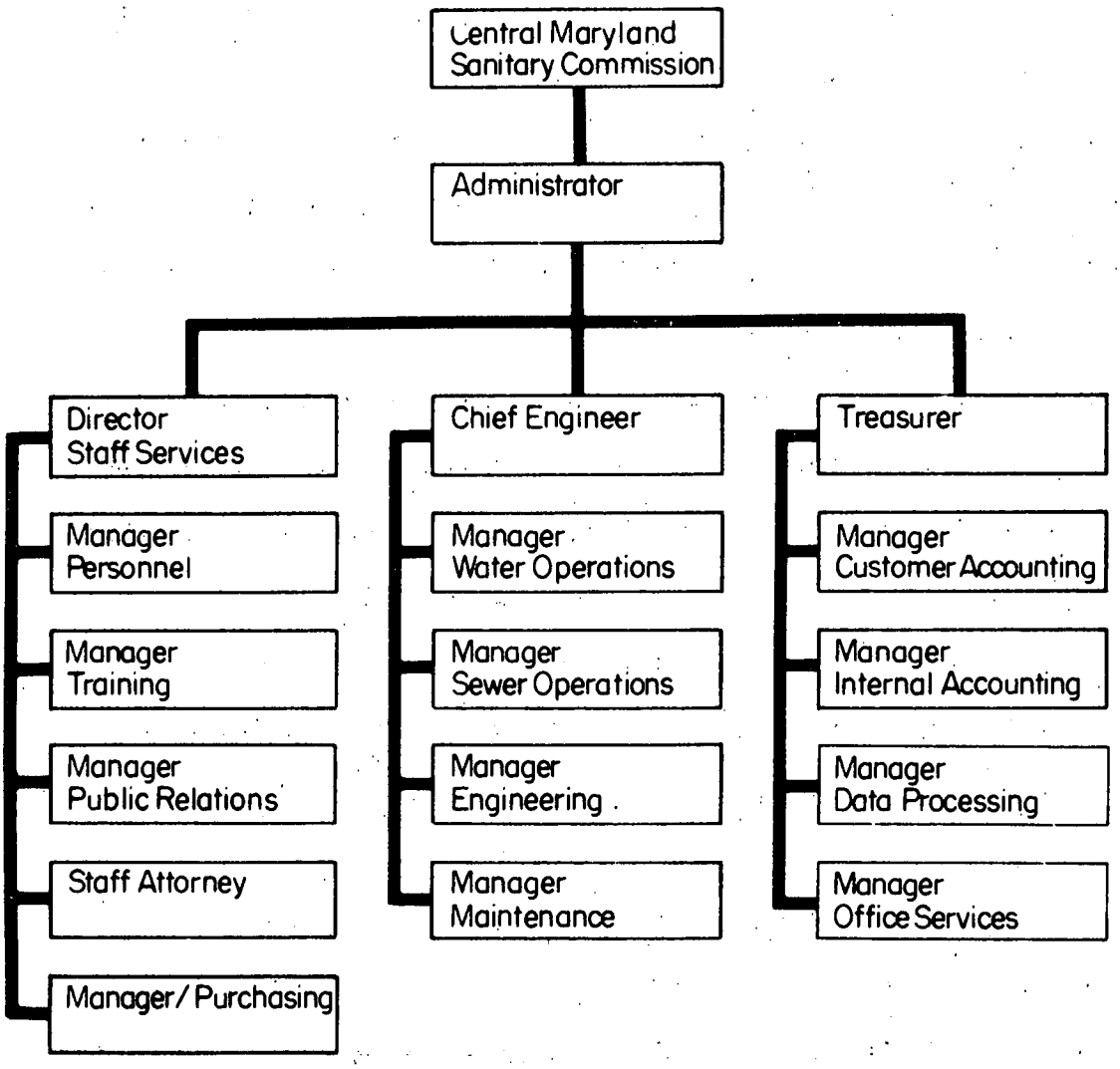
Obviously there is more than one way to organize our hypothetical utility, which we shall call "The Central Maryland Sanitary Commission". While the current trend in the Baltimore Region is toward a more or less uniform setup of Public Works Departments, present and past experiences locally show a number of ways to align a water and sewer operation. The organizations of other municipal and Commission utilities nationally show a variety of styles. The Washington Suburban Sanitary Commission has a form unique to its growth pattern, duties and personnel.

We present here an outline form of a possible organizational type that we believe well adapted to the component parts at hand. In a subsequent section of this chapter we shall describe a system of local Districts. These Districts do not affect the organization charts following and do not appear on them. The District Engineer shown on chart 15 would report directly to the Chief Engineer of the Commission.

The over-all organization of The Central Maryland Sanitary Commission is illustrated in chart 10 on the next page. Most of the major groups will be described in immediately following charts and pages of this section.

Chart 10

Overall Organization
Proposed Central Maryland Sanitary Commission



Division of Water Operations

The positions of Manager, Distribution Engineer and Operating Engineer are self-explanatory. While ordinarily we do not advocate the position of "assistant", we do believe that this Division, forming the heart of the water business, requires a man able to fill in for any of the three first-named men. The two staff engineers serve a multiple purpose. It may be expected that either or both the Distribution Engineer and Operating Engineer could be men without an engineering degree, or possessing one, could still be not well versed in most modern techniques being offered to the more recent engineering graduates. Since both sections of the Division will have ample opportunities for spot hydraulic studies, engineering economy studies and the like, these engineers would be expected to handle these if assigned by the Section Engineer, or they would form the liaison with the Engineering Division who would do the work.

Their second purpose is for training. Since even the engineer who has no ambition other than to head the Engineering Department requires operating experience to be good in that assignment as well as other, more advanced positions, these staff engineer spots would be most useful for rotating men on a 12- or 18-month basis. Of course, if the importance of the duties that were found to be accumulating to one or both staff engineers warranted, the position could be taken out of the "rotating" category and made permanent.

Division of Sewer Operations

Essentially the same comments hold true for this Division (chart 12) as for Water Operations. It will be noticed that we have shown a Superintendent for the Back River and Patapsco Plants only. Our intention is that every plant deemed

Chart II

Division of Water Operations
Operating Department

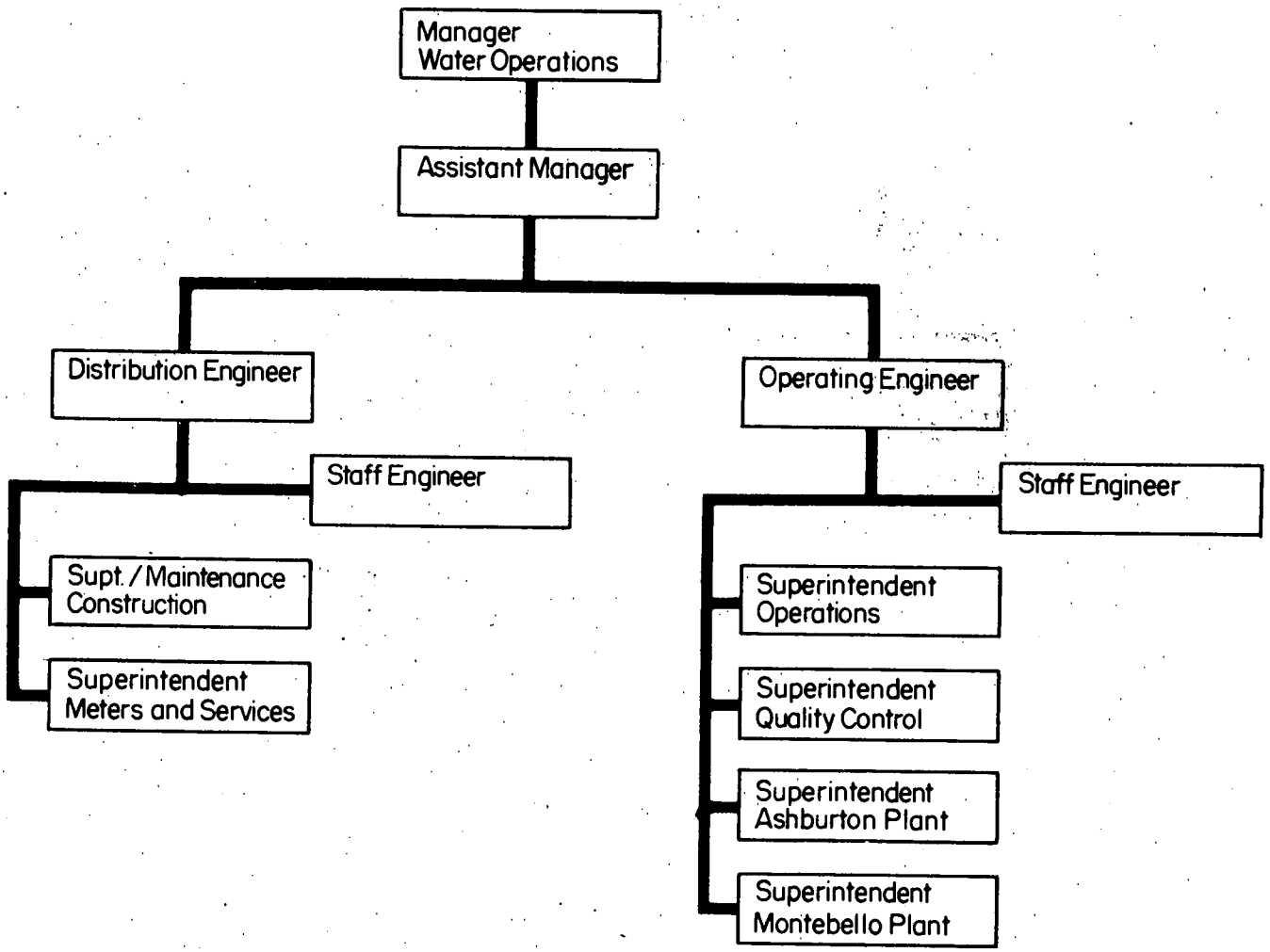
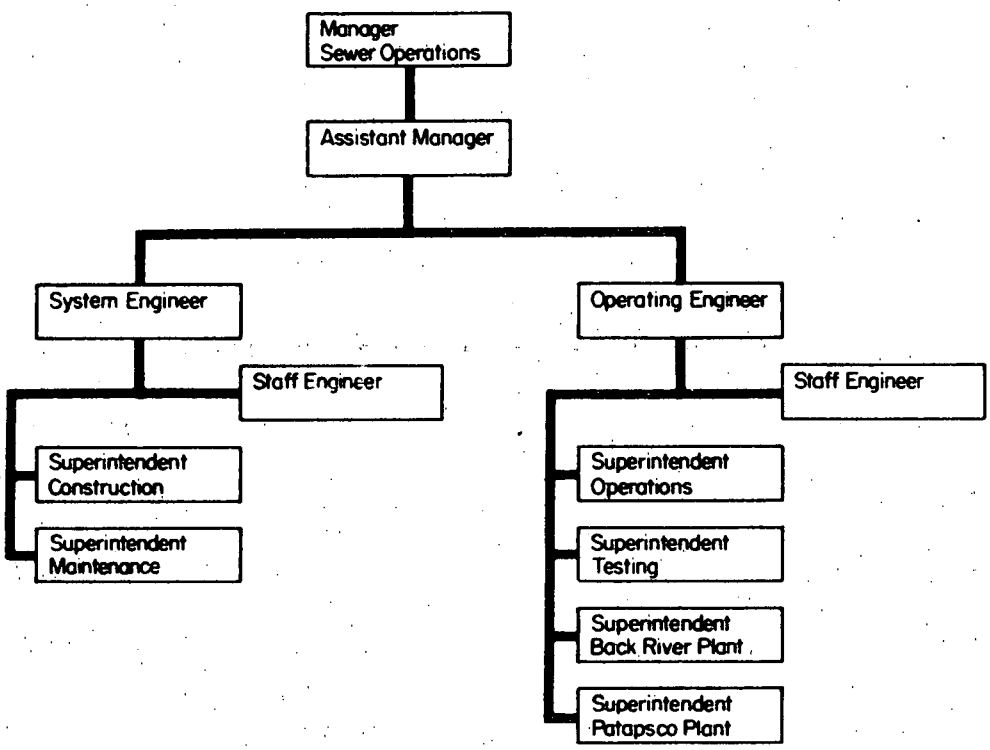


Chart 12

Division of Sewer Operations
Operating Department



large enough to have a Superintendent in fact will have one; we believe that Patuxent, Annapolis, Cox Creek and other smaller plants can be best handled by the appropriate superintendent of its appropriate district organization (chart 15). As a plant grows, a resident superintendent can be assigned.

Maintenance Division

This Division (chart 13) is intended to supplement the maintenance effort that the operating staff at each plant would be expected to give to grounds, structures and machinery. It would also completely maintain all nonattended stations. No sewer or water main work would be done here, as this type of skill would be concentrated in the respective operating divisions.

Major takedown of machinery, concrete work, painting, grounds work requiring machinery, preventive maintenance adjustments and checks, and all automotive work would be done by this Division. It is intended that no differentiation between sewerage and water supply functions need be made; what these crews would do can be done at both types of installations with very little "specialization" required. It is also contemplated that this Division would be partially centralized into roving crews and partially decentralized into semi-permanent assignment at some of the larger plants.

Preventive maintenance is today by no means uniform. A major task of the Maintenance Division's management will be to plan and implement this absolutely essential concept.

Division of Engineering

Chart 14 presents our proposal for the Engineering Division of the CMSC. Here we adhere to the regional trend in agreeing that a single engineering group can function for two fields; but the fields are not as dissimilar as bridges and water pumping stations.

Chart 13

Division of Maintenance
Operating Department

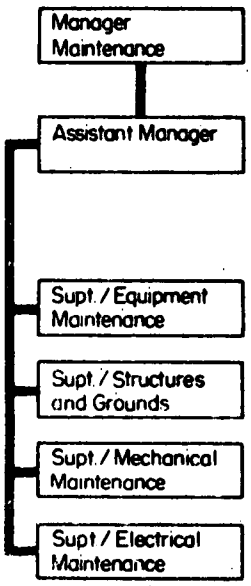
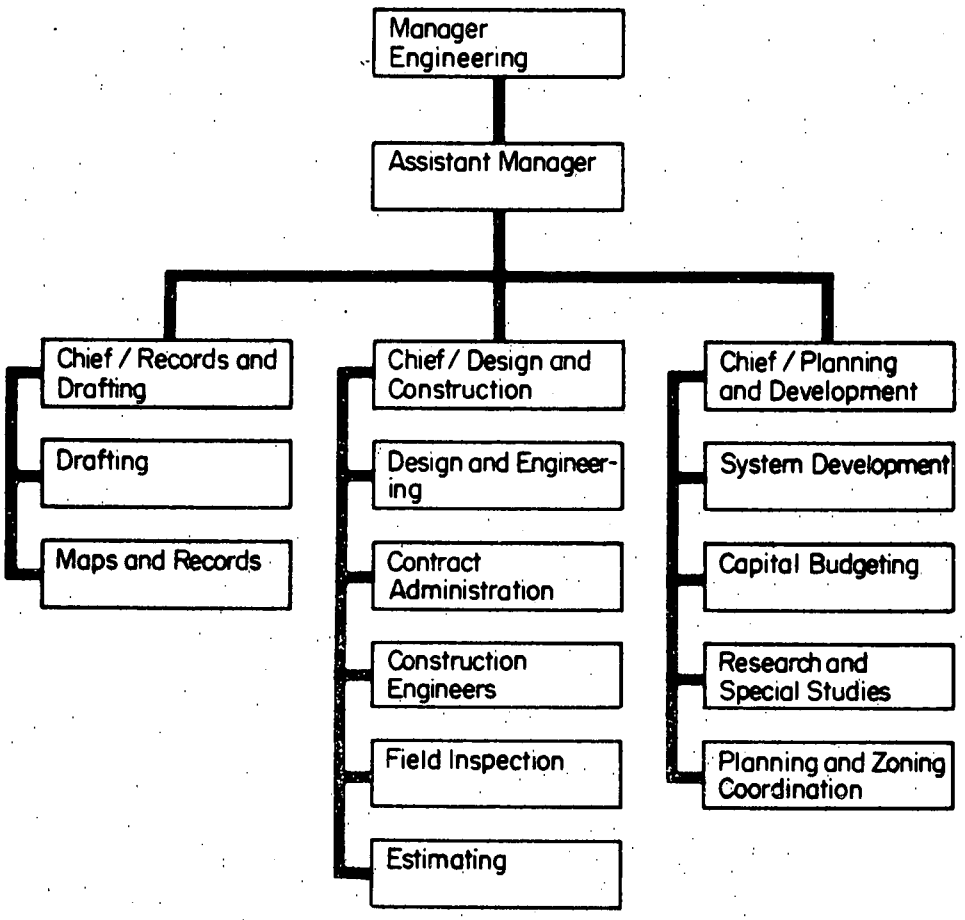


Chart 14

Engineering Division Operating Department



Worthy of mention on this chart is the Planning and Development Section. It is intended that this section accomplish utility aims, and not enter into the public policy field of long-range area development, reserved by law and tradition to other, more comprehensive groups. It is to be expected that close liaison will be established, as this section's long-range utility planning cannot be at variance with Regional goals.

It will perhaps be noted that nowhere in these charts do we postulate an assessment or rate group; if a rate specialist is deemed necessary he may be carried on the Administrator's staff. As for assessments, the present labyrinth cannot be erected again if it can be avoided.

Local Districts

While the City of Baltimore is in the middle, more or less, of the Region, and while the Ashburton plant and Park Terminal are also more or less in the middle of the city, with reasonable good access to freeways, we do not believe that the entire operation of the Central Maryland Sanitary Commission should be centralized. Even if all phases of the work, including engineering and distribution, could be well run from one central office, we think that the consolidating period (while all former entities are ceasing to think as a disjointed group and are beginning to think as a rational whole) will be less troublesome if district offices are created, with as little disturbance as possible from the former form and staffing.

A consideration of the geography of the area, the problems faced by each present utility and what in the line of staff and facilities exist in each service area leads us to suggest the following arrangement of territories.

Central District. The area formed by Baltimore City and County less the area south of the Patapsco River (South Baltimore and Hawkins Point). This district will have no organizational existence as a district separate form the main organization.

Anne Arundel District. The area formed by Anne Arundel County. The City of Annapolis would be included if it were a party to the merger. Glen Burnie or slightly to the south would be the logical place for the district office. (Since it is going to be almost a necessity for the new Public Works Department to find quarters near Annapolis, it might be possible to purchase the erstwhile Anne Arundel County Sanitary Commission Building.)

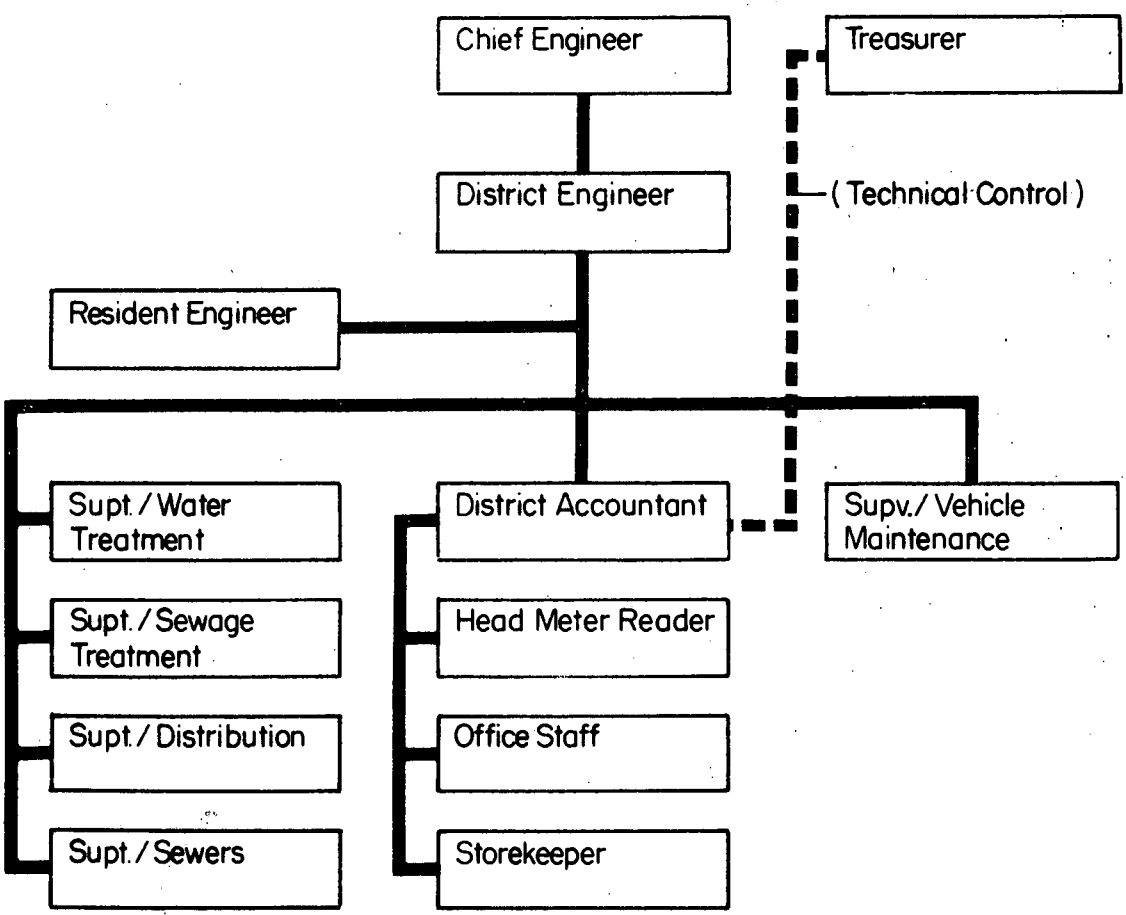
Harford District. The whole Harford County, including Bel Air, Havre-de-Grace, Aberdeen and Joppatown, if they become a part of the Commission. Headquarters would be best located in Bel Air unless one or both of these larger towns immediately joined the merger.

Carroll - Howard District. The area of Carroll County immediately in need of municipal services is too small and too localized in the southern part of the County to warrant a separate district of its own. The District, comprised basically of the staff of the old Howard County Metropolitan Commission, will serve the Sykesville area quite well. This District, therefore, will be formed of the whole of Howard County plus the southeast corner of Carroll County. If the municipalities of Carroll County join the merger and if substantial growth takes place around these communities, the need for creating another district may be re-explored.

A sample District organization is given on chart 15 following. In this sample District organization it will be noted that we have deliberately avoided the inclusion of specialists such as contract administrators and construction inspectors. We believe it is of considerable importance to avoid building in as many positions as possible in this type of decentralized operation, even though the determination to "leave them vacant until they are really needed" may be originally sworn to by all.

Chart 15

District Office Organization (standardized example)



We would expect that the Manager of Engineering would have available both contract administrators and inspectors, and even field engineers if needed. We would prefer, however, to have the fullest amount of local control possible over this type of activity. Thus, if a $100,000 main improvement were contracted for a given District, the District Engineer should be placed in formal charge of that contract by being designated in writing as Resident Engineer. If it is within the capabilities of the Superintendent of Distribution (both in terms of ability and time available) to inspect this contract, he should also be designated Field Inspector by formal notice. If he is not capable of this assignment (and this does not automatically indicate he is a poor Distribution Superintendent), then a Resident Inspector should be sent out and placed under the control of the District Engineer.

If by reason of workload or inexperience the District Engineer cannot adequately assume the duties of a Resident Engineer, one should be assigned from the office of the Manager of Engineering. In this case Inspectors should be automatically assigned to remove the possibility of conflict through having the Distribution Superintendent reporting to two people.

This type of operation is by no means new, being standard practice in most highway departments and Federal agencies. No divided authority or responsibility arises and some valuable diversified experience is available from time to time to the local Districts. This is especially useful to younger engineers who are assigned by the District Engineer to assist him on contract work. The key to success lies in the ability of the Chief Engineer and/or the Manager of Engineering to judge accurately at any instant whether a given District Office is able to take on another added assignment. Equally important is the keeping of the central pool of Residents and Inspectors at the proper level, avoiding both shortage and surplus.

Miscellaneous

We differentiate between "Staff Services" which provide the functions shown on chart 10 and "Office Services" under the Treasurer. This latter would handle mail room, telephones, receptionists (in main office buildings) office supplies, office management and the like.

While we indicate our agreement with the need for a central purchasing office (under Staff Services), we insist that these people be in constant touch and sympathy with the desires of the engineering, operating and maintenance people. This should be far easier to accomplish within this utility than in an entire city or county purchasing department.

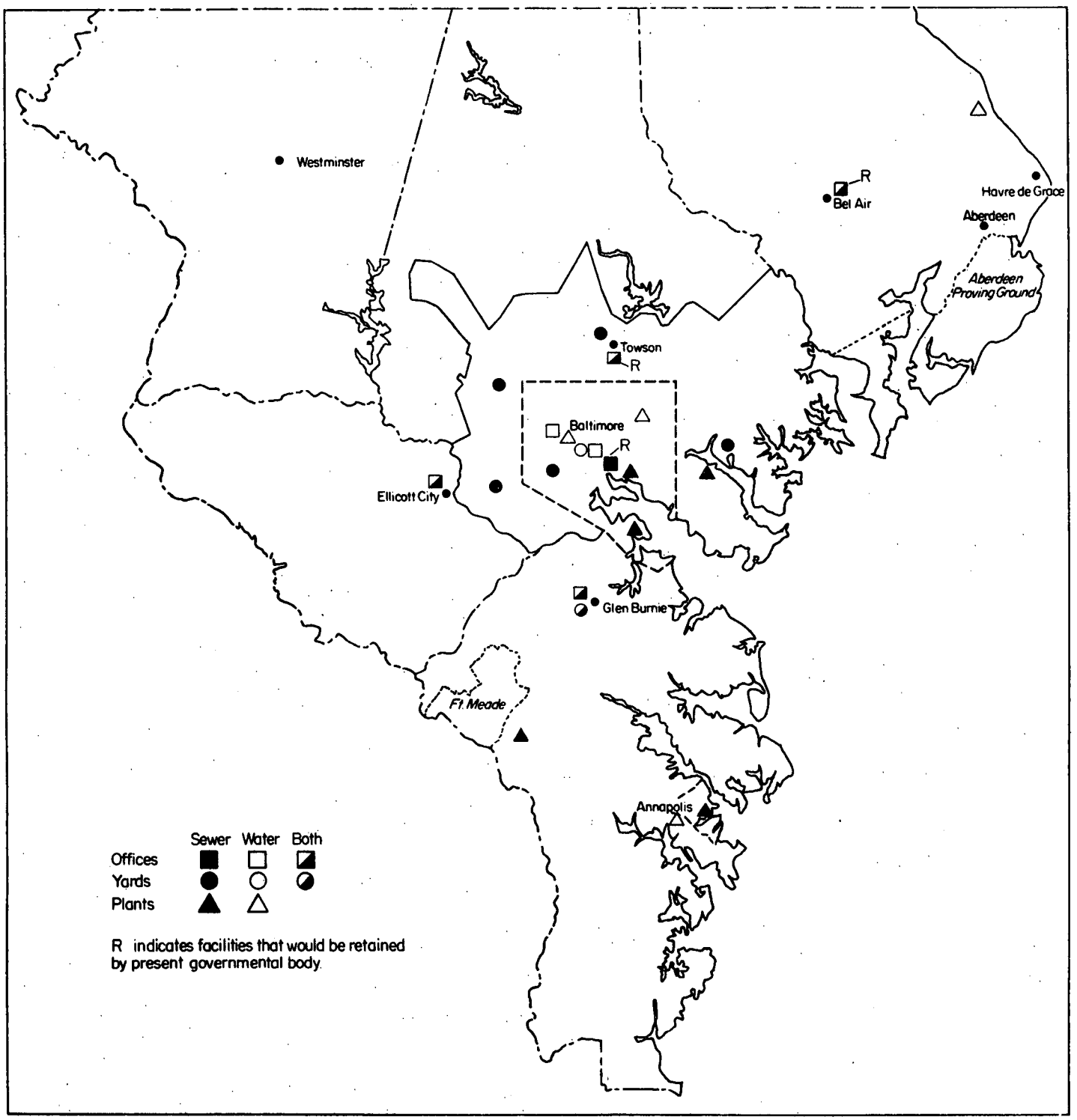
Facilities Available

To the question "would the CMSC need to undertake a building program to provide it with facilities which it would need for operation on its own but which would not be made available when the assets of the existing utilities are acquired", we answer in the negative. These nonavailable facilities would be office space in the Baltimore City and County and Harford County Municipal Buildings.

Map 3 following shows the major sanitary buildings, plants and yards in the area. Land exists in several locations for future construction if need arises, but better yet, there is usable (if not desirable) space in the Park Terminal Building, certainly sufficient to house the sewer office operations that need to be centralized. Ashburton could possibly house most of the central water operations. Rented quarters might be needed for a time, and eventually a single headquarters structure would probably be a desirable thing, but in terms of housing, the Commission could function directly upon its creation.

Map 3

Location of Major Water and Sewer Land and Buildings



Staffing and Salaries

We do not purport to have gone into the departmental structure of our proposed Central Maryland Sanitary Commission and determined the actual number of positions required unit by unit; except for our own determination of excess people, as previously stated, we assume that in the beginning these operational people now employed will be required in the new Commission. This may not be the case in the long run after actual operating experience is logged, but in the initial stages, with full decentralization a necessity, it must be assumed. The table illustrates the general outline of our staffing as we see it in existence in the separate bodies today. It also shows the major political bodies that are providing these people.

Although not a fair comparison, since the Washington Suburban Sanitary Commission handles refuse collection and disposal in one county and some storm drainage work, it is of interest to note that, on an area and population comparison, this proposed staff is about three-quarters that of the WSSC.

It may be a matter of interest just what level of compensation we would suggest for consideration for the top executives of this Commission. We are not averse to submitting our recommendations, but it must be understood that (a) supply and demand might require a higher salary for the right men and (b) it is not our intention that such a figure be "ratioed down" to set a salary structure for the entire organization. This is not in the realm of this report. We would suggest these salaries:

Administrator	$35,000
Chief Engineer	30,000
Treasurer	25,000
Director of Staff Services	18,000

Table 8

RECOMMENDED STAFFING OF

CENTRAL MARYLAND SANITARY COMMISSION

Administration	
Office of the Administrator	6
Operating Department	
Office of the Chief Engineer	12
Water Division	529
Sewer Division	491
Engineering Division	302
Maintenance Division	232
Total	1,566
Financial Department	
Office of the Treasurer	3
General Accounting Division	22
Customer Accounting Division	105
Data Processing Division	18
Office Services Division	25
Total	173
Staff Services Department	
Office of the Director	2
Personnel Division	12
Training Division	5
Public Relations Division	3
Legal Division	15
Purchasing Division	6
Total	43
Grand Total	1,788
Source of People	
City of Baltimore	1,132
Baltimore County	356
Anne Arundel County	169
Howard County	24
Carroll County	17
Harford County	16
New	74
Grand Total	1,788

We wish to point out that every manager or supervisor need not or should not receive the same salary. The Director of Staff Services' duties may not require the salary that will be commanded by the Treasurer; the Manager of Engineering may receive a different salary than the Manager of Maintenance. If this type of flexibility can be instituted and retained, the CMSC will have made a gain over its present constituent bodies.

Savings Due to a Complete Merger

The following summary presents our estimate of what might be saved in a complete Region-wide utility merger. The figures are on the basis of the "present" operating, maintenance, billing, accounting and financing costs, i.e. calendar year 1965. The yearly effect of the savings is seen in the five-year forecast sheets in a back section of this report.

	People	Expense
Operations	147	$ 838,000
Accounting	88	425,000
Staff Services	14	87,000
Construction	-	6,000
Financing	-	(50,000)
Subtotal	249	1,306,000
Picked up elsewhere	(161)	(922,000)
Net Savings	88	$ 384,000

The estimated operating, accounting and staff services savings come about through several sources but are calculated mostly on the present budgeted salaries and wages of personnel who, we believe, will ultimately prove superfluous to the merged operation. Capital construction savings are estimated to stem from more careful and complete staff engineering, better and more leisurely review of con-

sultants' work, standardized materials and methods and from working to a long-range regional development plan. They are calculated using a minimum rate of 3% interest on a saving of 1/2 of 1% on the annual average of $40,000,000 of construction expected in the near future. These savings would be cumulative; i.e., by taking the saving of interest rather than the actual possible expenditure saving of $200,000, we count a saving of $6,000 the first year, $12,000 the second, $18,000 the third, etc.

The negative saving from financing is due to an assumed increase in interest rates of 1/8% that the Commission would face, at least, initially, as the underlying credit backing of its securities shift from the governmental tax power to coverage from revenues only. We feel we have been quite conservative in including this figure.

It must be emphasized that savings due to reducing the numbers of excess people will not be immediately obtained. This is because we simply do not accept the philosophy of releasing people who may suddenly be classified as "extras". We most definitely recommend that personnel reductions be made through not replacing those leaving through the normal attrition of turnover and retirements.

We also believe that our estimate of savings, although of a nature whereby they will not all occur immediately, may ultimately prove very conservative. The bulk of our hypothetical personnel reductions can be pinpointed; no arbitrary assumption of increased efficiency has been made. If 300 people from Bureau "X" and 200 from Department "Y" are assumed merged, no further cut of Z% in the resultant sum has been factored in. We believe that ultimately, when each supervisor settles into his job, such further reductions can be made. Again, they must be attained by normal attrition. (If the staff is kept waiting for the next reduction in force, the effect on work performance may easily be imagined.)

Coincident Salary Adjustments

We believe that the majority of like job titles in the lower and middle grades will require that all holders of that title be at the same salary level, at least until promotion or merit salary increases bring forward the best men. Obviously, the highest salary bracket in the component groups must be the uniform bracket with the lower units raised accordingly. This doesn't have to be done; there are no major discrepancies among like positions in the Region. We think it should be done for reasons of equity. We also suggest that a general salary increase is needed in the near future for almost all of the nonlabor utility forces in the area. The average starting salary for graduate engineers, for example, as illustrated on page 34, falls about 12% short of those available to private power utility and Government engineers. We suggest that the bulk of the salaried personnel, forming about 35% of the staff, be scheduled to receive a 6% pay raise at or shortly after the time of the merger. This increase, if properly applied, will reduce many of the present and past merger salary inequities. This pay raise, if given, would absorb approximately $244,000 of the proposed savings realized in the merger.

We have not shown this increased cost in our tabulation of estimated savings because again it doesn't have to be done; it is not a condition of the merger required now. Obviously some salary hikes are now in process in an area this large, but they will not accomplish what we feel is required. If the defects of some current civil service type organizations is to be avoided, the time-honored fringe benefits and security which such organizations provide must be replaced fairly quickly by the substitute of money.

Ownership and Control

With the exception of a miniscule proportion of the total, all of the water and sewer utilities of the Region are now under public ownership of one form or another, either in Municipal or Commission form. If they are combined, while the process both legally and organizationally might be complex and long drawn out, the resulting ownership would be quite simple; i.e. public, belonging to the people. This is the last simple statement possible with regard to this subject. The control of the merger utility, or the Central Maryland Sanitary Commission, can only by indirection rest with the people; it cannot be run like a New England town meeting.

This question is intermingled with the question of recompense. Should the present owners just turn their assets over to the Commission, subject to existing debt, and enjoy control based on their proportion of assets? Should the Commission buy the assets outright and, if so, will control then be allotted on a geographic basis or a population basis? Further possibilities exist. Each present owner may retain ownership but turn over all personnel and operating responsibilities to the Commission.

The requirements for ownership and control can be more easily spelled out:

1. The Commission must be in the position of having sufficient legal control to satisfy investors that it has the ability to meet debt obligations.
2. The public in general must be protected from the possibility that any given political group or groups in the combination can use control to favor its own populace over the balance.
3. The public (or its political representatives) should be assured that there is some control that can be exercised if need be.

Point 3 is the rebuttal to so arranging the Commission makeup that it is in effect run by a czar; this type of body has the earned reputation of "getting things done", but it is also frequently viewed as stepping on the rights of groups and individuals, oblivious to criticism and entreaty.

If control were given originally in proportion to assets contributed, there would be a very large imbalance between the owners of the integrated systems and the other counties and towns. Could it be always assumed that the Baltimore representatives would willingly see water revenues used to finance expansion in other political jurisdictions?

If control were based solely on population, the City of Baltimore would have approximately half the votes, with Baltimore County holding another 30%. The situation would be very little different.

Control based on a geographic basis removes this problem (by geographic we mean one Commission member per political unit, totaling six). But then the reverse situation could take hold. The "underdeveloped" counties could jack up rates and bring water and sewers to everyone in an uneconomic crash program.

A way to sidestep this situation might be to put the entire Commission under the regulatory jurisdiction of the three-man State Public Service Commission.

We favor the concept of a nine-man commission, one from each major governing body in the Region plus three members selected by the other six. Each commissioner would enjoy one equal vote in the deliberations of the CMSC. Whether the members are salaried at some nominal amount or draw a small fee for each meeting is not important; we do believe that men of the caliber the CMSC deserves should not be expected to donate their time without at least their expenses being well covered.

As to appointment, obviously the executive of each component body should have the power of nomination with the consent of the corresponding legislative body. Terms of office should be staggered and incumbents should be eligible for renomination and reappointment.

Powers of the Commission - Legislation

The creation of the Central Maryland Sanitary Commission as a Region-wide body requires action by the Maryland Legislature. The inclusion of Anne Arundel County, Harford County on the City of Baltimore is impossible under existing law. Since new legislation must be obtained, there is no reason why the present model sanitary commission laws need be followed in all respects, though they appear to be excellent examples of corporate enabling laws.

Some of the essential powers that must be granted to the Central Maryland Sanitary Commission are:

(1) The power to conduct the water supply and sewage treatment business.

(2) The power of eminent domain. (This could be left in the hands of the member political bodies, but provision must be made to avoid deliberate inaction on the part of the governing body of any jurisdiction.)

(3) The right to issue bonds without referendum.

(4) The power to set utility rates. (This power may be subordinated to the Maryland Public Service Commission who could set rates after normal adversary-type hearings.)

(5) The power to levy special assessments. It is our feeling that this power, if granted, should not be used, or used only sparingly in special cases. It would be well to have such power, however, in order to meet expeditiously unique cases that could arise from time to time.

An additional power, useful only for the purpose of assuring the financial community that the CMSC has the ability to meet its obligations to service debt, would be the power to levy an ad valorem tax on the assessable property in its area. This right, if granted, should have a low upper limit.

We see no real disadvantage (and a great advantage) in backing the bonds of the Commission with the full faith and credit of the State of Maryland. This would be a not inappropriate blessing to bestow on the fledgling creation of the legislature, and it might be worth from $50,000 to $100,000 per year in reduced interest costs.

Fair Compensation for Systems

If it is decided that a commission is to acquire and operate certain or all of the present systems, the question of fair compensation for such systems will become of paramount importance. We can visualize and are outlining below a number of approaches to this problem, one or more of which might be regarded by all concerned as being equitable.

These approaches and our comments relating to each follow:

Approach (1) Each of the cities and counties entering into the integrated operation would transfer ownership of its water and sewer system properties to the Commission in exchange for the Commission's assumption of debt or guarantee to pay debt service charges on all debt outstanding applicable to the water and sewer systems at the time of transfer.

Approach (2) The fair value of each system would be determined by a reputable and competent appraiser or appraisers acceptable to the Commission and the respective cities and counties.

The Commission would then acquire the systems in exchange for the assumption of existing debt against each system, as outlined in (1) above, plus an amount in cash or debt obligations of the Commission equal to the excess of fair value over the sum of the amount of outstanding debt assumed plus contributions to construction made by customers.

Approach (3) The Commission would acquire the various systems in exchange for its assumption of existing debt, as outlined in (1) above, plus an agreement to place the acquired properties and future additions thereto on the tax rolls of the cities and/or counties, to be subject to ad valorem taxes on the same basis of assessment and at the same rates as would a privately owned utility. (It would be expected that no state ad valorem taxes would be paid).

Approach (4) Would be similar to the method of acquisition outlined in (3) above, except that each year the assessed value of property on which ad valorem taxes would be based would be reduced by a proportionate part of the then remaining balance of debt assumed at date of acquisition of the systems. For example, in each city and/or county, the basis of determining taxable value (the amount to which the applicable tax rate would be applied) and taxes payable for each year of operation of the integrated system could be as follows:

Book value of acquired property plus completed additions to date of assessment, say	$75,000,000
Deduct - remaining balance of debt assumed (say $30,000,000 less $5,000,000 principal payments since date of acquisition)	25,000,000
Balance	50,000,000
Assessed value for ad valorem tax purposes - 60% of balance	30,000,000
Ad valorem taxes payable $30,000,000 x 2.37 (tax rate)	$ 711,000

Approach (1) views the question of compensation solely from the standpoint of the water and sewer customer, i.e., keeping water and sewer rates at the lowest possible level. It gives no consideration whatsoever to fair value of the systems nor does it take into account the varying proportions of debt in relation to total property in the respective systems. We do not present it as an entirely equitable plan and its principal merit is that it would make possible lower rates to customers than would the other plans outlined. (This may be an attractive feature to those who may be primarily interested in obtaining the best conceivable settlement for their area's customers.)

Approach (2), properly carried out, would, in our opinion, be a means of establishing prices that almost anyone would consider fair and equitable. This is the standard method of determining value, though often weighted with other factors such as past and predicted earning power of the enterprise. However, "nut and bolt" appraisals of each of the system would be a very costly and time-consuming process. Also, it appears to us that one of the other approaches might, in the long run, be more attractive and prove more advantageous to all concerned in the special situation obtaining in the Baltimore Region.

Approaches (3) and (4) are very nearly identical except for final results. For this reason, our comments will be confined to approach (4) which we feel should be given serious consideration. As previously stated, acquisition of the systems in this way would mean that substantial values would be added to the tax rolls of each of the cities and counties, and a new source of continuing and increasing tax revenues of considerable magnitude would be created in each of the participating entities. It would be expected that the credit of each of them would be improved, thus leading to interest savings in the financing of future capital requirements.

In the event of integrated operations under a single body and acquisition of the systems through the "taxation route", we recommend that determination of values (assessed values) upon which taxes would be based be made annually by a qualified State agency. In other words, the cities and counties should have no voice in establishing taxable values. The reason for this twofold; it would insure that values in each taxing jurisdiction are made on the same basis and it should minimize any possible disagreement between such jurisdictions as to the fairness of the values.

It should be remembered that any taxes paid in line with the foregoing will be paid indirectly by the System's customers. However, it should be possible for the cities and counties to reduce other taxes correspondingly so that there would be no over-all increase in taxes to residents of the service area, or the full amount of taxes paid by the Commission could be used for the public good.

Since this is but one of several means of paying for acquired plant and is itself capable of several variations, and since the "real value" of the plant is at present unknown due to the lack of either reproduction cost-new or depreciated first cost data, we have not included property taxes as a component of

revenue requirements in our forecasts in the rear section of this report. Neither have we included any other reflection of compensation such as added debt service for cash payment. The amounts of the property tax payable under two variants of this proposal are computed in the last section of the report, but are not used in any further numerical presentations.

Disadvantages in a Merger

Aside from the more or less obvious disadvantage of placing a vital service beyond the direct control of each political subdivision, several other drawbacks appear when merger of sanitary utilities is contemplated.

Some loss of interdepartment cooperation will be experienced. This could be translated into negative savings but only after tremendous effort, considering the accounting and reporting systems now in use. For example: water and sewer vehicles would not automatically be available for snow plowing and salting, unless special contracts were arranged. We understand that this present collateral duty is fairly smoothly done, but we ordinarily feel that the highway people should do this sort of work with highway department vehicles.

As another example, a number of present Departments and Bureaus will have "revenue" sources disappear as the sanitary utilities no longer make use of their services and their fixed costs must be spread over fewer remaining "customers". This will add to the cost of remaining municipal services unless compensated for. We think the Central Maryland Sanitary Commission will find itself saving money due to this freedom.

Gross revenue requirements are increased. Even though the savings listed on page 72 will be attained, the fact that the CMSC will be financed by revenue bonds rather than by the full faith and credit of the various local governments means a certain safety margin (or profit) must be earned each year to satisfy the

holders of the Commission's debt that their investment is secure; this requires a higher revenue for the Commission.

Immediate savings will not be obvious. This is a readily-understood point and is not necessarily a true disadvantage in merging. The necessary dust-raising that a consolidation would require would be so obvious that many would no doubt expect prompt and sharp cost decreases once the dust settled. If excess personnel were phased out in a humane way, much of the potential savings are deferred for some time. It would also be quite hard for anyone to see savings because very few know what present costs are. Again, with rate increases facing Commission customers, the average citizen could well conclude that no savings were made, forgetting that he faced similar increases under the old operations.

A more detailed discussion of the economic aspects of merging is undertaken in the section of the report entitled "Conclusions and Recommendations".

Other Advantages

Some other points in favor of an over-all merger of all water and sewer utilities in the Baltimore Region are not too often advanced. Except for No. 1, these points are more or less noneconomic.

1. As a counter to the disadvantage of being required to earn a safety margin on debt service requirements, the Commission has the advantage of being able to apply this margin to the following year's construction requirements. This is in effect an enforced partial "pay as you go" program, and the cumulative effect is to markedly lower debt financing, as can be seen in the financial statements in the Forecast of Operations section and also in summary form under "Conclusions and Recommendations".

2. Sooner or later, urbanization of the area between Baltimore and Washington will be almost as great as it is now between New York and Philadelphia. Increasingly, matters of water and sewer service, stream pollution and the like will be discussed on a super-regional basis. This means, for example, that the Washington Suburban Sanitary Commission will be dealing with the Anne Arundel County Public Works Department and the Howard County Metropolitan Commission, and probably with the City and County of Baltimore as well. We believe that the interests of the citizens of this area will be better served and protected if an equally muscular body dealt with the WSSC. An organization able technically and financially to throw services into an area regardless of immediate economics will protect against the possibility of, say, Howard County being forced into an unattractive "take it or leave it" contract with the WSSC if it were faced with a sudden emergency of some sort.

3. This country will see increasing Federal activity in water resources and waste disposal, in the East as well as the arid West. A large, sophisticated regional water and sewer utility may be better able both to obtain and utilize Federal funds that become available and to withstand obtrusive and unwarranted pressure that could conceivably materialize from Washington.

4. While there is not a noticeable lack of talent in the very top ranks of the Region's water and sewer operations at this moment, considering the magnitude of the job, they are too few and are at too low a salary. Any one of the utility managers could

likely obtain a better paying job elsewhere. Some have. The task of managing the operations we speak of here is no job for second-rate people. A large utility can pay its managers more than a small utility and can attract and keep better men in the second, third and lower ranks.

PART II - PARTIAL COMBINATION

Available Alternatives

Between the extremes of doing nothing except intramural housecleaning and starting afresh with a Region-wide merger lie a number of improvement possibilities of varying magnitudes. A complete analysis of the courses of action available to the Region's utilities requires that the most likely of these intermediate possibilities be studied and commented on. The very large list of mathematical possibilities can be by inspection reduced to a handful of choices which logic indicates are both operationally and financially possible.

Not all of the choices in this middle ground involve mergers. Those that do not will be discussed after the merger combinations. It will be noted that of the mergers, alternative I is the full Regional CMSC, introduced here as a yardstick.

Determination of Optimum Combination

In order to determine what combination of utilities in the Region might offer overall benefits that are equal or greater than the complete merger into the Central Maryland Sanitary Commission, it is necessary first to define what is meant by "benefits" and second to hit upon a way to present the results of the possible combinations in a numerical manner easily understood.

After a long analysis, we choose to define benefits as dollars per average customer saved via a merger over where the customer would be if the utilities continued on alone. To remove the factors of operating surplus or deficit, break-even revenue requirements are divided by average customers to get per-customer revenue (or cost, from the customer viewpoint). Numbers of customers and revenues are from our estimates.

The measurement we selected is the synthetic value customer-dollars; we thus say that in terms of total benefit to the Region, it is as important that one customer save two dollars as for two customers to each save one dollar. It is equally an overall gain that one customer somewhere pays one dollar more if another customer can pay two dollars less.

Statement 1 following page 90 summarizes the forecasted utility financial results for each political body in the Region. Estimated profit or loss is either deducted or added to determine the break-even revenue requirements. Revenue per customer is presented at the bottom of the statement. (It should be noted that total revenue on Statement 1 is different from consolidated revenues on Statement 3 of the Preliminary Report because inter-utility transactions have been eliminated from the latter presentation.)

Statements 2 and 3 illustrate the financial results of seven different merger possibilities. No. I is the Central Maryland Sanitary Commission. Another explanation is required to allow a clear understanding of what is being shown. The Commission's Financial Statement (Statement 17 at the end of this report) shows a net profit ranging from $4,052,000 in 1965-66 to $7,795,000 in 1969-70. To keep a comparable set of results possible, this profit has also been deducted from revenues to give break-even requirements; this in spite of the fact that we assume that some profit margin will be required by the financial community in this revenue bond situation. Nevertheless we may deduct this reserve or margin if we are aiming at the operating break-even point. (We have ignored for the sake of expediency the small added debt service that would be required if this profit were not available for the following year's construction.) We also omit from all of these calculations any property tax considerations, since it is not central to the answer sought and not by any means the only method of compensation. In fact any added costs to the

merged utilities in any alternative due to compensation, other than assumption of existing debt service, has been omitted. This must be done due to the variety of methods available.

In addition to the CMSC, the following merger combinations are shown on Statements 2 and 3:

II. The City of Baltimore and Baltimore County.

III. II plus Anne Arundel County.

IV. III plus Howard County.

V. IV plus Carroll County (omitting only Harford County).

VI. All Counties, omitting the City of Baltimore.

VII. All Counties, omitting the City of Baltimore and Baltimore County's Metropolitan District.

Alternative VI, the omission of the city from the CMSC, has inherent in it two major possibilities. One is that the City continues to engage in the utility business as it has always done, continuing to provide retail and wholesale water under the existing or similar agreements. The other is that the Commission formed on its perimeter buys outright all City facilities for water and sewer service and undertakes to serve all city customers as if they were its own. The City, being adequately paid in some manner for its hardware and its customers, would have no further interest in the water and sewer business other than as one of the Commissions bigger customers.

Alternative VII, the merger of the outlying areas ex the integrated Baltimore system, assumes that northern Baltimore County would join the merger, providing the physical link between Harford County and the other members. We have assumed in this analysis that during the five years of the forecast period this section of the County would neither add any customers or require any capital expenditure, all county growth going into the Metropolitan District.

Statements 4 and 5 compare the total advantage or disadvantage in customer-dollars in joining the particular merger over continued individual operation. Starting with alternative II, (City and County of Baltimore) we see that the progressive addition of each succeeding County increases total Regional benefits until, with the final inclusion of Harford County, the identical results shown for I, the CMSC, would be obtained. The differences between III, IV and V are small, and the order in which the smaller counties are added would not greatly affect the results. (The customer-dollar figures are not the absolute advantage of the CMSC over individual operation. The advantage is shown on Statement 7.)

Inspection of Statement 4 shows that the City and Baltimore County, because of their preponderance of customers, are subsidizing the savings realized by customers in the outer counties, as these counties are added to the Commission, but the very high per customer savings obtainable in these outer counties factor out to a net overall gain in benefits.

Alternative VI shows that only 1,881,000 customer-dollars are obtainable in 1970 via a five-county merger. It would be possible however for the City of Baltimore to simultaneously effect an interior reorganization and obtain much of the savings indicated on page 58 of the report. Consequently we have included 664,000 customer-dollars resulting from this action. This merger is of greater overall benefit than the others in the first two years of the forecast period but rapidly becomes the least beneficial toward 1969-70.

Alternative VII provides only a modest 620,000 customer-dollars in the last year, but has the flexibility of permitting alternative II, the Baltimore City-County merger, to take place coincidentally. As a consequence, since we can assume that both mergers are large enough to allow both Commissions to realize together savings equal to that obtained in the CMSC, the total customer-dollar benefits in each year are identical to those of the CMSC.

Statement 6 presents for easy comparison the 1969-70 benefit figures and the corresponding revenue requirements per average customer for each of the seven merger schemes. To the right of the lower figures are the amounts that the average customer would pay if the complete CMSC merger were adopted instead of the particular merger combination that proved best for each individual unit. Since the Central Maryland Sanitary Commission (or the double merger, VII) optimizes overall Regional benefits by $9.72* per customer, it does not seem unreasonable that the City and the County of Baltimore forgo the $15.75 difference that they could have by a merger of the two. The cost per customer of the CMSC over continued individual operation is shown in the second column at the bottom right. The total "subsidy" that the Commission gets from the City and County are $5.32 and $7.23 per customer, respectively.

Coordination by Contract

One method exists by which it would be possible to obtain a good portion of the benefits of a complete merger without any merger at all. This would be for all the Regional utilities to agree beforehand to employ a single firm or consortium as a managing agent to plan, coordinate, construct and operate the various utilities as a single integrated whole. The most usual instances of such agreements are found in the transportation industry, but there the managing group is usually always a large operator also. It would be possible here that the City of Baltimore could contract with the five counties to manage their systems. The drawback is that not all would agree that the City has done an outstanding job of managing its own facilities. The best alternative would be to hire carefully selected firm or create a non-profit consortium of managers and engineers for the purpose.

* 4,137,000 customer-dollars ÷ 425,800 customers

Statement 1

REGIONAL WATER AND SEWER UTILITIES
SUMMARY OF FINANCIAL FORECASTS AND CALCULATION OF BREAK-EVEN REVENUES

(Thousands of Dollars)

	1965-66	1966-67	1967-68	1968-69	1969-70
City of Baltimore					
Revenue	$19,084	$19,716	$20,427	$21,162	$21,873
Profit (Loss)	687	720	958	1,071	554
Required Revenue	$18,397	$18,996	$19,469	$20,091	$21,319
Baltimore County					
Revenue	$10,295	$10,727	$11,199	$11,705	$12,159
Profit (Loss)	1,089	522	(52)	(723)	(1,591)
Required Revenue	$ 9,206	$10,205	$11,251	$12,428	$13,750
Anne Arundel County					
Revenue	$ 4,931	$ 5,240	$ 5,614	$ 6,024	$ 6,481
Profit (Loss)	1,075	322	(552)	(1,458)	(2,074)
Required Revenue	$ 3,856	$ 4,918	$ 6,166	$ 7,482	$ 8,555
Carroll County					
Revenue	$ 341	$ 353	$ 368	$ 383	$ 398
Profit (Loss)	56	(36)	(107)	(294)	(493)
Required Revenue	$ 285	$ 389	$ 475	$ 677	$ 891
Harford County					
Revenue	$ 645	$ 684	$ 709	$ 746	$ 776
Profit (Loss)	(94)	(227)	(413)	(501)	(614)
Required Revenue	$ 739	$ 911	$ 1,122	$ 1,247	$ 1,390
Howard County					
Revenue	$ 559	$ 599	$ 641	$ 682	723
Profit (Loss)	(202)	(496)	(640)	(873)	(1,132)
Required Revenue	$ 761	$ 1,095	$ 1,281	$ 1,555	$ 1,855
Total Revenue	$35,855	$37,319	$38,958	$40,702	$42,411
Total Profit (Loss)	2,611	805	(806)	(2,778)	(5,350)
Total Required Revenue	$33,244	$36,514	$39,764	$43,480	$47,761
Required Revenue Per Customer					
City of Baltimore	$ 83.21	$ 86.19	$ 88.46	$ 91.36	$ 97.13
Baltimore County	73.47	78.20	83.90	88.71	95.22
Anne Arundel County	112.09	137.76	165.75	190.87	207.65
Carroll County	63.33	84.57	98.96	135.40	171.35
Harford County	89.04	102.36	121.96	128.56	136.27
Howard County	205.68	267.07	284.67	317.35	350.00

Statement 2

REGIONAL MERGER ALTERNATIVES
CALCULATION OF PER CUSTOMER REVENUES

(Thousands of Dollars)

		1965-66	1966-67	1967-68	1968-69	1969-70
I	Central Maryland Sanitary Commission					
	Revenue	$ 36,833	$ 40,961	$ 43,914	$ 47,123	$ 51,417
	Profit (Loss)	4,052	5,333	6,095	6,638	7,795
	Required Revenue	$ 32,781	$ 35,628	$ 37,819	$ 40,485	$ 43,622
	Customers	397,400	404,200	409,900	418,800	425,800
	Revenue per Customer	$ 82.49	$ 88.14	$ 92.26	$ 96.67	$102.45
II	City of Baltimore - Baltimore County					
	Revenue	$ 29,379	$ 30,443	$ 31,626	$ 32,867	$ 34,032
	Profit (Loss)	1,776	1,242	906	348	(1,037)
	Estimated Savings	393	753	1,653	2,546	3,518
	Required Revenue	$ 27,210	$ 28,448	$ 29,067	$ 29,973	$ 31,551
	Customers	346,500	350,900	354,200	360,000	363,900
	Revenue per Customer	$ 78.53	$ 81.07	$ 82.06	$ 83.26	$ 86.70
III	Baltimore, Baltimore & Anne Arundel					
	Revenue	$ 34,310	$ 35,683	$ 37,240	$ 38,891	$ 40,513
	Profit (Loss)	2,851	1,564	354	(1,110)	(3,111)
	Estimated Savings	442	846	1,857	2,860	3,953
	Required Revenue	$ 31,017	$ 33,273	$ 35,029	$ 37,141	$ 39,671
	Customers	380,900	386,600	391,400	399,200	405,100
	Revenue per Customer	$ 81.43	$ 86.07	$ 89.50	$ 93.04	$ 97.93
IV	Baltimore, Baltimore, Anne Arundel and Howard					
	Revenue	$ 34,869	$ 36,282	$ 37,881	$ 39,573	$ 41,236
	Profit (Loss)	2,649	1,068	(286)	(1,983)	(4,243)
	Estimated Savings	449	859	1,887	2,905	4,015
	Required Revenue	$ 31,771	$ 34,355	$ 36,280	$ 38,651	$ 41,464
	Customers	384,600	390,700	395,900	404,100	410,400
	Revenue per Customer	$ 82.61	$ 87.93	$ 91.64	$ 95.65	$101.03

Statement 3

REGIONAL MERGER ALTERNATIVES
CALCULATION OF PER CUSTOMER REVENUES - CONTD.

(Thousands of Dollars)

	1965-66	1966-67	1967-68	1968-69	1969-70
V Baltimore, Baltimore, Anne Arundel Howard and Carroll					
Revenue	$ 35,210	$ 36,635	$ 38,249	$ 39,956	$ 41,634
Profit (Loss)	2,705	1,032	(393)	(2,277)	(4,736)
Estimated Savings	454	868	1,906	2,935	4,056
Required Revenue	$ 32,051	$ 34,735	$ 36,736	$ 39,298	$ 42,314
Customers	389,100	395,300	400,700	409,100	415,600
Revenue per Customer	$ 82.37	$ 87.87	$ 91.68	$ 96.06	$101.81
VI Anne Arundel, Howard, Carroll Baltimore County and Harford					
Revenue	$ 16,771	$ 17,603	$ 18,531	$ 19,540	$ 20,538
Profit (Loss)	1,924	85	(1,764)	(3,849)	(5,904)
Estimated Savings	211	403	885	1,363	1,883
Required Revenue	$ 14,636	$ 17,115	$ 19,410	$ 22,026	$ 24,559
Customers	176,200	183,800	189,800	198,900	206,300
Revenue per Customer	$ 83.06	$ 93.12	$102.27	$110.74	$119.05
VII Same as VI Except Excluding Metropolitan District (I - II)					
Revenue	$ 6,476	$ 6,876	$ 7,332	$ 7,835	$ 8,379
Profit (Loss)	835	(437)	(1,712)	(3,126)	(4,313)
Estimated Savings	70	133	292	449	621
Required Revenue	$ 5,571	$ 7,180	$ 8,752	$ 10,512	$ 12,071
Customers	50,900	53,300	55,700	58,800	61,900
Revenue per Customer	$109.45	$134.71	$157.13	$178.78	$195.01

Statement 4

REGIONAL MERGER ALTERNATIVES
COMPARISON OF TOTAL REGIONAL BENEFITS

(Thousands of Customer - Dollars)

		1965-66	1966-67	1967-68	1968-69	1969-70
I	City of Baltimore	159	(430)	(836)	(1,168)	(1,168)
	Baltimore County	(1,130)	(1,297)	(1,121)	(1,115)	(1,044)
	Anne Arundel County	1,018	1,771	2,734	3,693	4,334
	Carroll County	(86)	(16)	32	194	358
	Harford County	54	127	273	309	345
	Howard County	456	734	866	1,081	1,312
	Net Gain	471	889	1,948	2,994	4,137
II	City of Baltimore	1,035	1,128	1,409	1,781	2,289
	Baltimore County	(634)	(375)	247	764	1,230
	Net Gain	401	753	1,656	2,545	3,519
III	City of Baltimore	394	26	(229)	(369)	(176)
	Baltimore County	(997)	(1,027)	(751)	(607)	(391)
	Anne Arundel County	1,055	1,845	2,837	3,835	4,520
	Net Gain	452	844	1,857	2,859	3,953
IV	City of Baltimore	133	(383)	(700)	(943)	(856)
	Baltimore County	(1,145)	(1,270)	(1,038)	(972)	(839)
	Anne Arundel County	1,014	1,779	2,757	3,733	4,393
	Howard County	455	734	869	1,086	1,320
	Net Gain	457	860	1,888	2,904	4,018
V	City of Baltimore	186	(370)	(709)	(1,034)	(1,027)
	Baltimore County	(1,115)	(1,262)	(1,043)	(1,030)	(952)
	Anne Arundel County	1,022	1,781	2,755	3,717	4,361
	Howard County	456	735	868	1,084	1,315
	Carroll County	(86)	(15)	35	197	362
	Net Gain	463	869	1,906	2,934	4,059

Statement 5

REGIONAL MERGER ALTERNATIVES
COMPARISON OF TOTAL REGIONAL BENEFITS - CONTD.

(Thousands of Customer - Dollars)

		1965-66	1966-67	1968-68	1978-69	1969-70
VI	Baltimore County	(1,202)	(1,947)	(2,463)	(3,086)	(3,441)
	Anne Arundel County	999	1,594	2,361	3,141	3,650
	Howard County	454	713	821	1,012	1,224
	Carroll County	(89)	(39)	(16)	123	272
	Harford County	50	82	181	173	176
	Subtotal	212	403	884	1,363	1,881
	City's Estimated Savings by Reorganization	580	601	622	643	664
	Net Gain	792	1,004	1,506	2,006	2,545
VII	Anne Arundel County	91	109	321	473	521
	Carroll County	(208)	(231)	(279)	(217)	(123)
	Harford County	(169)	(288)	(324)	(487)	(599)
	Howard County	356	543	574	679	821
	Subtotal	70	133	292	448	620
	City of Baltimore) Merged Under	1,035	1,128	1,409	1,781	2,289
	Baltimore County) Plan II	(634)	(375)	247	764	1,230
	Net Gain	471	886	1,948	2,993	4,139

Statement 6

REGIONAL MERGER ALTERNATIVES

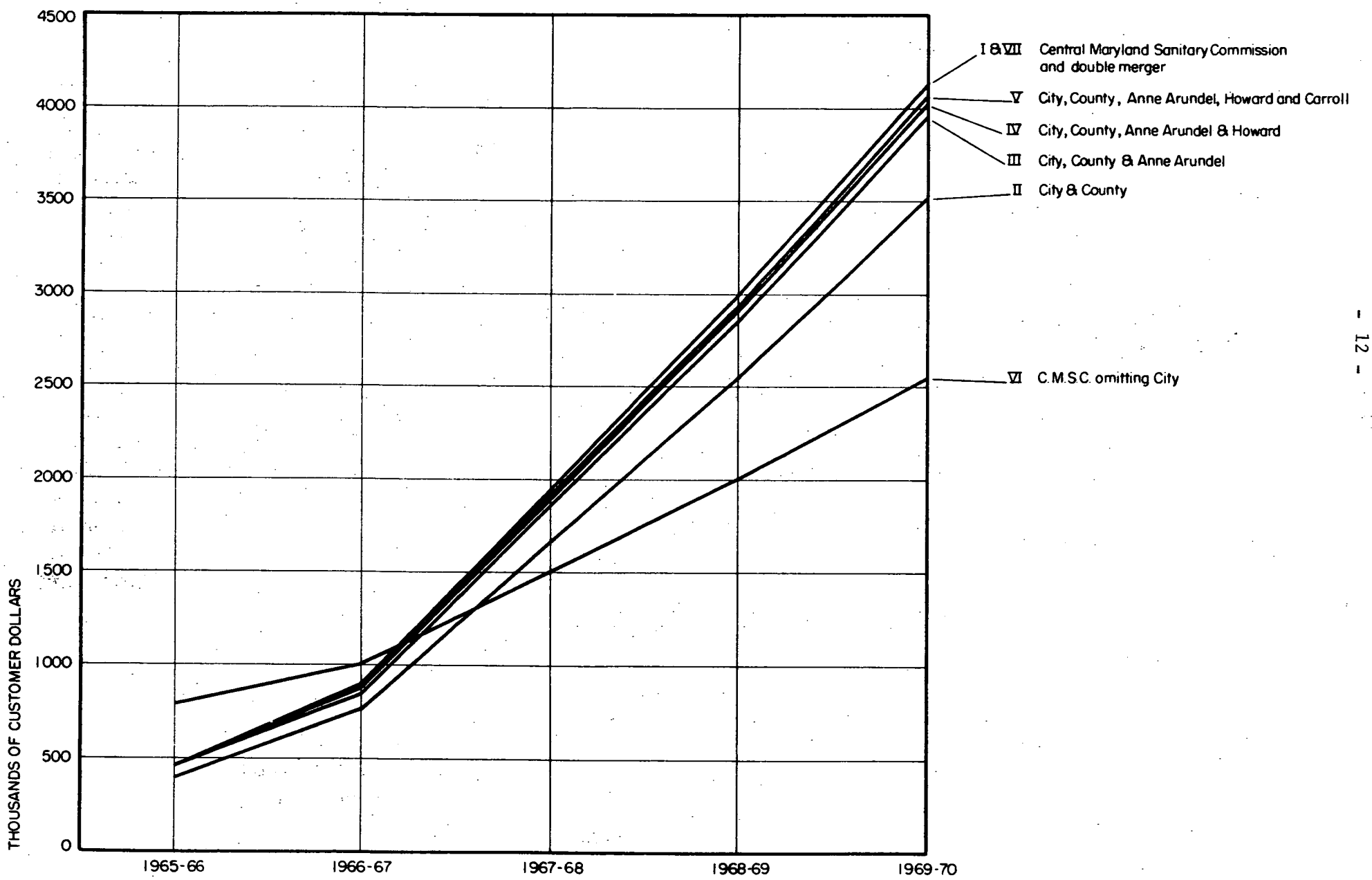
SUMMARY COMPARISON

1969-70 Figures

	As-Is	I (CMSC)	II	III	IV	V	VI	VII (Double Merger)
Customer - Dollars (000)								
City of Baltimore		(1,168)	2,289	(176)	(856)	(1,027)	664	2,289
Baltimore County		(1,044)	1,230	(391)	(839)	(952)	(3,441)	1,230
Anne Arundel County		4,334	-	4,520	4,393	4,361	3,650	521
Howard County		1,312	-	-	1,320	1,315	1,224	821
Carroll County		358	-	-	-	362	272	(123)
Harford County		345	-	-	-	-	176	(599)
Total		4,137	3,519	3,953	4,018	4,059	2,545	4,139

Average Revenue per Customer									CMSC Over Best Individual Alternative	CMSC Over Individual Operation
City of Baltimore	$ 97.13	$102.45	$ 86.70	$ 97.93	$101.03	$101.81	$ 97.13	$ 86.70	$(15.75)	$ (5.32)
Baltimore County	95.22	102.45	86.70	97.93	101.03	101.81	119.05	86.70	(15.75)	(7.23)
Anne Arundel County	207.65	102.45	207.65	97.93	101.03	101.81	119.05	195.01	(4.52)	105.19
Howard County	350.00	102.45	350.00	350.00	101.03	101.81	119.05	195.01	(.64)	247.55
Carroll County	171.35	102.45	171.35	171.35	171.35	101.81	119.05	195.01	(.64)	68.85
Harford County	136.27	102.45	136.27	136.27	136.27	136.27	119.05	195.01	-	33.82

Comparison of Merger Alternatives



We will not elaborate on the potential advantages; at best all the benefits of a Commission that would stem from coordination and management could be obtained. The fiscal and morale benefits might be impossible to attain. The problems of such an operation could be formidable:

1. Some individuals will be working for two employers.
2. The managing group would not be likely to enjoy the right to hire, fire and promote personnel.
3. The managers will always feel obligated to demonstrate visible impartiality, which may very well be at odds with sensible and efficient planning.
4. Unless a great number of contingent financial arrangements are agreed to in advance, the managers will be perennially in a position of attempting to wheedle the several owners into acting on new financing plans in concert.

Sale to a Private Utility

This course of action has been summarily rejected as least desirable by at least one report on the Region's problems, but is nevertheless a valid one. Four potential classes of buyer can be assumed: (1) An existing utility in the area now in the utility business in general, though not in the water or sewer business. This would include the telephone, gas and electric, transit and railroad companies. It is not easy to visualize any of them eagerly entering into negotiations for such a purchase. (2) A utility holding company. The general pattern of these operators is to buy much smaller systems and then usually only water utilities. It is just conceivable that this large a transaction might be interesting. (3) A newly-formed local company. This group would be made up of local businessmen and investors and

would probably need to gather wide public and institutional financial support.

(4) A large non-profit foundation. Such a purchase would be a new venture for this type of body, but the financial resources exist and some have expressed interest in aiding the orderly growth of urban centers.

The advantages of operation by a private utility are:

(a) Correction of personnel and morale problems. Employees would likely be immediately unionized, which would give them even better protection and benefits.

(b) Orderly development and efficient management.

(c) Automatic protection of the public by the Public Service Commission.

(d) Tax payments to state and local governments. (This has a countering disadvantage below.)

Disadvantages are:

(a) High rates. Income and ad valorem taxes must be covered as well as some profit margin for the equity holders.

(b) Such a sale apparently goes against today's trends in thinking, which accepts public acquisition of utility operations and natural resources but would likely be horrified by a reverse transaction.

(c) Federal and state aid now received and expected would be foregone. This could prove a severe blow to the construction program. (We point out again, however, that we have assumed <u>none</u> in our forecasts.)

(d) Local and state governments would lose policy control over utility operations and the coordination of utility planning with highway, land use and other plans might be rendered more difficult.

Indications are that a revenue flow similar to that shown on Statement 17 in the Forecast Section <u>could</u> support private operation at a profit. All would

depend on what investment were required to buy the plant; book figures would be of no value here and a physical appraisal would be an absolute necessity. Allowable rate base, depreciation rates and possible capitalization ratios would all help determine profitability.

Commission Ownership of Central Facilities

Yet another possibility exists for obtaining some savings, coordinating growth and financing construction. This would be to create a "Central Maryland Sanitary Facilities Board" which would plan, build, own and operate the Region's backbone water and sewer plant; namely, sources of supply, transmission lines and attendant pump stations and treatment plants. All sub-transmission and distribution mains and attendant pumps and reservoirs and all customers would remain under present ownership. The situation would exactly parallel the English power setup, with the Central Electricity Generating Board owning and operating all supply and transmission and local Distribution Boards handling all else.

Inherent in this scheme, in our opinion, would be the fundamental policy that all water sold to a municipality and all sewage accepted from a municipality would be subject to the same unit rate, unless by agreement the Board instead of the recipient constructed special mains to a given area.

If the Board were given the power to pre-empt all existing and potential water supplies, orderly and economic development of the Region's water resources should follow, given competent engineering on the Board.

With distribution and customers remaining with the present governmental units, whatever extension policies, service quality and rate schedules the units desire may be applied. Water and sewer service may be viewed locally as something to make a profit on or to subsidize, depending on the political climate and other

local factors. If expedient, the distributing utilities may also buy and sell among themselves.

A Central Facilities Board such as this would be a much easier entity to organize and manage than a full CMSC. It would have only about 38% (680) of the staff of the Commission, would have absolutely minimal customer accounting and meter reading and would require but a fraction of the vehicles and construction inventories. Given a good start in its contractual relationships with the distributing agencies, it has few inherent disadvantages except lack of political responsibility to governments in the Region.

Obviously a number of prickly problems arise, centering on where and how volumes are metered, which lines are initially classed as central or distribution and where, when and now much water (or sewage) will be sold in the future. It might be some little time, for example, before a sensible wholesale metering system were available to the Board.

The Facilities Board patently would hold life and death power over economic expansion in the Region if it is given all water resources. The response that it makes to growth in demand must, as in the case of CMSC, be carefully balanced between public duty and economics. Its problems are simpler, however, since it is faced only with infrequent major decisions, while the Central Maryland Commission has not only the major decisions but innumerable minor decisions, which are, however, of vast importance to those involved. It might be well to place it also under the State Public Service Commission. This is not quite as important as for the CMSC, since the buffer of required local expenditure lies between the local demand for uneconomic extension and the eventual capital expansion in backbone facilities.

While it shows no basic internal defect, the selection of the Central Facilities Board as the vehicle for improvement has the external defect of simply not

touching at all or at best only easing partially a great portion of the Region's existing problems in the water and sewer field. Foremost among the problems escaping solution are equitable customer treatment via simplified rates, while the very important problem of improved employee morale is only partially corrected. These two problems are more important in the Region than may be known.

It can be finally stated that if the Central Maryland Sanitary Facilities Board were created, it would not in any way hinder further expansion into the Central Maryland Sanitary Commission whenever one or more distributing utilities desired to join it.

Ownership by the City of Baltimore

Probably the least complicated alternative, other than doing nothing, would be for the City of Baltimore simply to buy out the other water and sewerage systems and operate them as integral parts of the Bureaus of Sewers and Water Supply. There are many precedents for this course of action.

As unpalatable as this plan may seem to many, it has several good points, not all of them obvious. For example: (a) Planning and development of long-range supplies would remain in the hands of those that have done the preponderance of such work in the past; (b) not too much disorganization need be expected in the change-over since, with the exception of Baltimore County's office facilities at Towson, the outlying utility offices are ideally suited geographically for district headquarters (recognized in the section of this report on a complete merger); (c) the dollar value of assets to be acquired would be far smaller than if, say, the City itself were too bought out.

Perhaps the greatest advantage attainable (other than coordination) stems from one of the reasons why the City should <u>not</u> buy the other systems. Ordinarily

an expansion of this type would be contemplated on the basis of picking up the fringe growth areas as a means of expanding profitability, since they may be served at a low incremental cost from the central system, an advantage not available to the fringe locations; in fact, the mature utility is buying someone else's growth potential by offering lower cost, more reliable service.

Alas, this is not truly the case here. The central utility will be acquiring the growth potential, true enough, but it is all not necessarily capable of being served at a low incremental cost. Much of it, badly needing service, will be at a very high cost to serve. This purchase might not be a good "business venture" at all under present rate schedules, and herein lies the great potential advantage.

If the present outlying systems are to be operated as an integral (though not necessarily integrated) part of the City systems, some outcry may be expected, and properly so, as to why there need be such radical variance in rates. Some variance is explainable, but much is the current result of factors that would disappear if this purchase were made. We believe that the City, in fairness to its newly-acquired customers and to protect itself, would be impelled to initiate a complete regional rate overhaul, which would of necessity include a cost of service study. The results would be very similar if not practically identical with those that would issue from a similar study by the Central Maryland Sanitary Commission. All customers, with due allowance for actual cost differences, would be treated equally. The possibility of choosing to subsidize any or all customers with less-than-cost services would be dead. The possibility of choosing to make a profit for the benefit of the City still exists, and may be a possibility that should be allowed to live. Here again, however, it might be well to place the City under the power of the Public Service Commission. The PSC need not be averse to a public body making a profit, if

customers are treated impartially and the profit is reasonable. The City, too, must expect to fulfill the same obligations for "uneconomic" expansion that the CMSC would carry out.

The single greatest disadvantage of such a purchase is that it might never be possible to effect the sweeping improvements in personnel policies that are so important in the Region, particularly in the City. Of all possible combinations here discussed, this one, in our opinion, would see the largest number of voluntary resignations from the units to be amalgamated. This matter can not be downgraded; morale in many areas has been poor and only exceptional overhaul of existing personnel practices can improve it.

Analysis

As we indicated, the smaller mergers depend on maintaining the present status quo in terms of water sales and sewer treatment with the substitution of a Commission of some sort on one or both sides of the table. It can be argued that this lacks complete realism, but the parallel assumption that all present utilities will go on for at least five years under the present agreements would then be equally unrealistic. The magnitude of difference, or the savings possible, would be the same, since the pattern of change in contract would be quite the same. For the sake of clear analysis of the alternatives, basic data changes leading to new financial results for each possibility is undesirable. It must be expected, however, that final negotiations, legislation, and contracts, etc., would recognize any actual changes in methods of operation and capital requirements that stemmed from the merger pattern chosen. We, with present data, feel that such changes would be minimal in total impact.

If any credence is given to the numbers in Statements 1 through 6 the Central Maryland Commission or the double merger (VII) should be adopted. The

mere existence of two Commissions is not enough to make VII unwise, though the pair would certainly be an oddity. While our simple analysis showed equal total benefits, it should be expected that total "overhead" costs for the two should be greater than it would be for one CMSC. The certainty of realizing savings will be reduced.

Alternatives VI and VII both contemplate putting together a utility that is not at the present self-sufficient in water supply or treatment facilities. It might never be self-sufficient in water unless the surrounding counties bought the City's Susquehanna supply.

To us, there is little in favor of creating a distribution utility that has nothing to distribute except what it purchases from others. We suggest as another alternative the leaving of distribution and customer activities in the hands of the local utilities, with supply and disposal services to be purchased from a Facilities Board; this is not the same as creating a new entity of this sort, however.

A partial merger contemplates someone being left out. The logical people to consider leaving out are those that are at the moment physically disconnected from the others. This would be The Harford County Metropolitan Commission and the municipalities in Harford County as one group; the municipalities in Carroll County and the fledgling Commission as another group and the nonintegrated sections of the Anne Arundel County DPW plus Annapolis as the third group.

The balance, then, is essentially the central geographic area covered by the Baltimore Integrated Water and Sewer Systems and its wholesale service area. Politically and organizationally this is where much of the present trouble centers.

In a nutshell, the largest point in favor of a merger of the central group is the simple truth that the system is in fact one; therefore, little possible diseconomy, considering the populace as a whole, could be suffered if it were owned, financed and operated as one.

Conversely, the largest point against a combination of central system utilities is that it is completely arbitrary, being determined in extent by the results of countless past compromises, partially completed plans and response to pressure. Another dubious point is that this central merger will ignore those border areas that are not now in the integrated system, but need to be and could be. If the boundaries were set firmly as mentioned, these border areas would become the responsibility of the outer utilities, who are least financially able to bring services to them. The revenue-producing connections have been given to the mature segment.

Statement 6 shows that Anne Arundel and Howard Counties would benefit substantially by any merger alternative. Physically, though the former has substantial ground water sources now developed, they are both heavily dependent on purchased water and will be entirely dependent for most of their future growth. This will be very soon the case if Anne Arundel attracts industry as quickly as some predict. Their inclusion in a Commission seems very advisable.

Harford County, though standing to gain from the Central Maryland Commission gains least, and is also the only body except the City that is likely to be self sufficient in water for a number of years to come.

Of the four non-merger alternatives, we favor the Central Maryland Sanitary Facilities Board by a wide margin. It is a sensible compromise of centralization and local control, provides a workable and easily organized structure and effects a good portion of the Region's needed improvements. It also is not an "either-or" choice, but may be looked on as an interim step to the CMSC. It also could be the easiest entity to dissolve (due to its non-involvement with retail customer and distribution plant) if it were deemed desirable to do so.

Organization

Essentially we would at this stage of study state that any less-than-Regional utility, including the Facilities Board, should have very nearly the organizational structure that we have presented for the Central Maryland Sanitary Commission. There would be some obvious changes in accounting, distribution, district offices, etc., depending on which alternative were chosen, but the pattern would still hold.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS AND RECOMMENDATIONS

Resumé of Problems Faced

The Baltimore Region today faces the following problems in its attempts to furnish continued, improved and expanded services in the water and sewer field:

1. Ever-increasing demand for sanitary services in the suburban and semi-rural areas surrounding the city.
2. The almost certain need for rate increases to cover projected operating deficits.
3. Continued and increasingly more complicated dealings between a multitude of bodies to effect the degree of coordination and agreement required for added service.
4. A very serious inability to attract and keep young and promising employees, particularly in the engineering field.
5. A situation of declining employee morale in a number of locations.
6. A complex and sometimes highly inequitable rate and assessment structure in several locations.
7. An overly-compartmented and inefficient organizational structure in some locations.

A listing of problems such as these can be made for hundreds of organizations in dozens of fields of endeavor. The degree of seriousness of each of these points in the Baltimore Region, however, demands that steps be taken to meet these problems. In our opinion, it is not wise to assume that the best interests of the people of the Region can be served by the continuation of present utility operations.

Individual Improvement

We think that worthwhile operating savings can be attained by a number of changes within the largest utilities. In relation to the time required to form

a Commission of any kind, these changes could be accomplished quickly. They should be studied, modified and implemented. (It must be recognized that such savings do not appear at once, particularly if they depend on reductions-in-force by attrition.)

The problem with individual water and sewer utility improvement is that unless companion improvement is carried out in accounting, finance, purchasing, central service and personnel operations, only a portion of the problems requiring correction will be touched.

It is unlikely that many of the suggestions we offer in this line would be wasted if a Commission was ultimately created. Therefore we submit that an immediate start on the most attractive ones should be made.

Formation of a Commission

Economic Advantage. To most, the matter of economics is probably the point of greatest concern when weighing the merits of the outlined Central Maryland Sanitary Commission against the merits of continued as-is operation. This section will present the total dollar difference between the two for each of the five years in the forecast period ending in 1969-70.

Statement 7 following presents the pertinent data.

The first set of figures presents total unconsolidated financial results for the Region's utilities under continued as-is operation. These are the same figures that appear on Statement 1 with the additional detail of operation and maintenance expense and debt service. (The complete detail appears on the individual forecast sheets provided at the rear of the report for each utility.)

The second set of figures are the revenue and expense deductions that must be made from the arithmetic totals of the first set to arrive at a consolidated picture of operations. In other words, inter-utility purchases, sales and

Statement 7

THE ECONOMIC ADVANTAGE OF THE

CENTRAL MARYLAND SANITARY COMMISSION

	1965-66	1966-67	1967-68	1968-69	1969-70
Present Operation - Unconsolidated					
Total Revenues	$35,855	$37,319	$38,958	$40,702	$42,411
Total Operating Expenses	14,960	15,895	16,806	17,855	19,070
Total Debt Service	18,284	20,619	22,958	25,625	28,690
Profit - (Loss)	$ 2,611	$ 805	$ (806)	$(2,778)	$(5,350)
Consolidation Eliminations					
Deduct From Revenues	$ 729	$ 771	$ 823	$ 886	$ 956
Deduct From Operating Expenses	729	771	823	886	956
Present Operations - Consolidated					
Total Revenues	$35,126	$36,548	$38,135	$39,816	$41,454
Total Operating Expenses	14,231	15,124	15,983	16,969	18,114
Total Debt Service	18,284	20,619	22,958	25,625	28,690
Profit - (Loss)	$ 2,611	$ 805	$ (806)	$(2,778)	$(5,350)
Central Maryland Sanitary Commission					
Total Revenues	$36,833	$40,961	$43,914	$47,123	$51,417
Total Operating Expenses	13,795	14,671	15,513	16,481	17,607
Total Debt Service	18,986	20,957	22,306	24,004	26,015
Profit - (Loss)	$ 4,052	$ 5,333	$ 6,095	$ 6,638	$ 7,795
CMSC Over - (Under) Consolidated Operations					
Total Revenues	$ 1,707	$ 4,413	$ 5,779	$ 7,307	$ 9,963
Total Operating Expense	(436)	(453)	(470)	(488)	(507)
Total Debt Service	702	338	(652)	(1,621)	(2,675)
Profit - (Loss)	$ 1,441	$ 4,528	$ 6,901	$ 9,416	$13,145
Absolute Advantage of CMSC					
Excess of Added Profit over Added Revenues	$ (266)	$ 115	$ 1,122	$ 2,109	$ 3,182

expense or revenue transfers should be eliminated as their inclusion merely inflates the revenue and expense figures and does not reflect moneys coming in from utility service users on being paid out for materials, supplies or services.

The third grouping is the consolidated Regional as-is forecast, i.e. the top figures with the eliminations performed. (It will be noted that the consolidation subtractions have no effect on ultimate profit or loss.)

The next presentation is the operating forecast for the Central Maryland Sanitary Commission. (No amounts for property tax payments are included.)

With a comparable breakdown of both present and merged operations side-by-side, it is simple to see the differences between the two. This is shown in the next succeeding statement below that of the CMSC. First, it is obvious that the Commission requires higher revenues from the ultimate consumers than the continued individual operations, ranging from $1,707,000 more in 1965-66 to $9,963,000 in 1969-70. Even after the individual utilities raise rates or get subsidies to offset their expected losses of up to $5,350,000 by 1969-70, the difference would still favor individual operation.

Operation and maintenance expense is lower under the CMSC, by $436,000 in the first year to $507,000 in the last. (This stems from the presentation on page 72, less the construction and financing components. It should be pointed out that page 72 is a calendar year 1965 statement and the figures on this statement are fiscal year.)

Debt service is higher for the Commission in the first two years, but becomes lower in the final three, reaching a difference of $2,675,000 in 1969-70. There are three reasons for this, combining to outweigh the added interest cost due to revenue bond financing. They are, in order of magnitude:

1. The profit for the year's operations, which we assume will be required (at least in the early years of building the CMSC's credit rating)

by the financial community, will be applied to the following year's construction program, thus cutting the need for debt financing from $4,052,000 in the second year of the forecast to $7,795,000 by the sixth year.

2. Debt is assumed sold in discreet amounts annually and income from reinvested excesses accrue to the CMSC until the funds are expended for construction.

3. Total annual construction expenditures are assumed to be $200,000 lower under the Commission due to better master planning and co-ordination, better engineering and design and improved contracting and inspecting procedures.

The yearly "profit" of the Commission is over the individual utilities by $1,441,000 in 1965-66 and increases to an excess of $3,145,000 in 1969-70 (a loss of $5,350,000 for the as-is utilities added to a $7,795,000 profit for the CMSC).

The final row of figures on the statement is our finding of the absolute dollar advantage of merged Commission operations over the present operations continued. In the year 1965-66, if Commission customers are asked to pay $1,707,000 more in revenues for only $1,441,000 added net profit, there is clearly a diseconomy of $266,000 chargeable to the Commission. But this reverses and becomes a modest gain of $115,000 in 1966-67, and grows to $3,182,000 by 1969-70; customers pay $9,963,000 more than they would under individual operations, but the utility (owned by the public, we would emphasize again) has higher profits totaling $13,145,000.

The argument can be introduced that what matter added profits? If the consumers pay almost $10,000,000 more for services, how can they benefit? First

of all, over half of this added revenue has to be found in any event, to counter the estimated $5,350,000 loss in 1969-70. Secondly, the "profit" immediately accrues to the benefit of the present and future ratepayers, since it is reinvested in utility plant; it is the "present worth" of equivalent debt financing. When maturity of the system occurs, the profit may be utilized for debt retirement or can be applied to rate reductions. We would suspect that before this happens it would be possible (if deemed desirable by the Commission) to reduce the profit margin due to a good credit rating.

The Commission, in effect, is not only raising rates to cover future operating losses; it is shifting to a much greater degree of "pay-as-you-go" financing than has been current in the Region, and it is carrying (because it is required to) a larger contingency figure in the form of this "profit" each year.

The dollar figures for the CMSC absolute advantage are less than the "customer-dollar" figures for total net gain under alternative I on Statement 4. The difference is the consolidation eliminations; Statements 1 through 6 deal with the CMSC (and other mergers) versus non-consolidated as-is operations. This was necessary because individual utility figures formed the basis of the calculations on these Statements and individual utilities cannot be "consolidated."

Other Advantages. The formation of a Commission provides the one best opportunity of clearing away the problems of coordination and cooperation, salary levels, employee morale and cumbersome rate structures. What is sorely needed is a fresh start, a chance to build anew on new foundations rather than a mere remodelling of the old structures.

Partial Mergers. From the viewpoint of the Baltimore Region as a whole and considering the reasons for mergers listed on pages 61 & 62, no less-than-complete combination gives the benefits that a complete merger does, though several come

close. The double merger, VII (described on page 89 and Statement 5) equals the total savings of the CMSC but creates a Commission that would not be self-sufficient as to water supply. It also produces a long and awkward geographic layout.

From the viewpoint of Baltimore City and Baltimore County only merger II (or VII) provides positive savings. All other combinations result in the customers in these two systems paying higher rates in order to provide much lower rates for the balance of the customers in the Region. This cannot be explained away; the bulk of revenues will be supplied by the City and environs for years to come, for that is where the bulk of the customers are.

Other Alternatives. As we mentioned, the possibility of a Central Maryland Sanitary Facilities Board to build and operate backbone supply, treatment and transmission plant has few inherent disadvantages. It simply does not bring relief to as many areas as the CMSC would. It may be looked on as a very good interim step on the way toward a full merger.

The Question of Equity. Statement 6 shows that the CMSC would cost the average City customer $5.32 in 1969-70 and would cost the average Baltimore County customer $7.23 in the same year. This added cost flows directly through to profit, however, and is used for construction in the following year. It is therefore taking the place of a long future series of debt service payments that the same customer would have to cover.

It must be constantly kept in mind that the "average customer" analysis has been chosen for uniformity and convenience only. If our recommended region-wide cost of service study for water and sewer service under the Commission resulted in marked cost differences in serving the City of Baltimore compared with the other areas, these differences should be reflected in rates in the respective service zones. All factors of present rates and topography indicate that any rate

differential will be in the favor of the City and likely the County, also. It is quite possible that the respective $5.32 and $7.23 "subsidy" could entirely disappear once new rates were introduced. At the moment, without even the form of the future rate structure known, we lack the data for any other comparison than a simple average-customer one.

Even a direct "subsidy" does not disturb us. If a Commission acquires the plant of the City for some agreed-upon fair compensation, those customers within the City should not have any inherent title to their former rate levels. If the metropolitan area had been served all along with one water-sewer utility as it has been with telephone, gas and electricity, rate schedules would have been uniform and present customers and past customers would have been, through this uniform rate structure, helping to cover suburban expansion as well as maintaining their own existing service.

In the long run, with the City fulfilling the role of business, government and cultural center of a major metropolitan area, it is as important to Baltimore as it is to the local government to have healthy local growth with full municipal services in the city's environs.

As for equity in the several acquisition payments, there can be no serious disagreement with simply paying to the present owners in some mutually acceptable manner the depreciated value as determined by competent appraisers, ex the outstanding debt assumed. This is the simplest way, except for turning the property over to the Commission upon assumption of the debt without additional payment. We propose the alternate method of placing the property on the tax rolls as a means of both (a) avoiding massive financing for payment and (b) countering erosion of urban ratables and because (c) it is required by law in Anne Arundel County. Our other recommendations should be rated on their merits regardless of the acceptance or rejection of this point.

In many instances customers are also purchased, as well as plants, the philosophy being that they have a monetary value as revenue producers and their future revenues have a tangible present worth. This is not a factor in this situation, since all of the utilities are publicly-owned and are not being operated as profit-making enterprises. There is consequently no equity return amount to capitalize into a present worth, or going-concern value.

Recommendations

After a careful review of all material available to us, interviews with operating, financial and planning officials and visits to most of the water/sewer plants and utility headquarters, we have made the necessary analyses required to permit us to offer our comments on the future course of water and sewer utility organization and financing that in our judgment will best serve the people of the greater Baltimore Region. A summary listing of our recommendations follows:

1. We recommend that a six-party Sanitary Commission be set up comprising all of the major political bodies in the Region. This Commission would be created by legislation closely paralleling existing Maryland law. The Commission would assume all outstanding debt of its constituent bodies, but would make no other direct payment for existing facilities within its boundaries (unless Recommendation 2 is not followed).
2. We recommend that this Commission be made liable for ad valorem tax payments to its constituent bodies for the appraised value of its property less presently outstanding debt plus future additions. This may be viewed as an indirect payment for the utility properties.
3. We recommend that with the exception of capital contributions by mass developers and commercial-industrial concerns above a

certain size, all possible revenue be realized by a single uniform regional connection and commodity schedule. We further recommend that rate changes be preceded by a full cost-of-service study. (This study might well prove that absolute rate uniformity is out of the question due to variance in the real cost to serve certain areas. The goal should still be as simple and uniform a rate structure as possible.)

4. We recommend that the Commission be placed under the jurisdiction of the Maryland Public Service Commission regarding rates and quality of service. System planning would be undertaken in coordination with local and state governments through their local and state planning agencies such as the Regional Planning Council.

5. We recommend that all personnel directly concerned with water and sewer service in the Counties and the City, (including billing, accounting and finance) be offered a position with the proposed Commission at a salary at least equal to the highest present salary paid to the equivalent grade in any of the major political bodies.

6. We recommend that the proposed Commission be required to follow generally accepted principles of accounting and that annual audits by independent public accountants be required to ensure uniformity and reliability of account-keeping and financial data.

These summary recommendations convey the gist of our findings, but we recommend careful reading of the section of the report where they are first

presented in order to avoid possible misunderstandings arising from such brief statements.

The cost savings attainable in a merger are impressive, even though they make take some time to realize. The apparent lack of immediate economic advantage to the City of Baltimore requires its utility and financial management to carefully evaluate its situation, particularly its forecasted financial statements, and balance its possible "subsidy" of initial CMSC operations against the other long-term potentials of integration.

To us, the attraction in a Regional Commission is not primarily in dollar savings, useful as they are; what appeals to us most is the immense improvements that could eventually be attained in planning, coordination, equitable customer treatment and employee morale.

The centralization of control in one self-financed body seems to us the only sound way to ensure that political differences, financial pinches, taxpayer revolts or simple disagreements do not permit anybody to either advertantly or inadvertantly destroy or delay a required joint construction venture. This safeguard is deserving of utmost emphasis.

Great emphasis must also be placed on the last two factors, customer and employee relations. Over-all, equitable revenue-producing methods and morale have deteriorated to the point where we believe the best chance for improvement lies in a fresh start. With a source of water assured, the two most important possessions a utility has are its customers and its employees. We think the Region's utility customers and employees will be best served by a Commission.

We wish to make it clear, however, that the Sanitary Commission is proposed <u>solely</u> within the context of a utility management study and that a broader view of governmental and administrative aspects might indicate significant modifications to avoid a proliferation of action agencies and a consequent loss of democratic responsiveness and lack of coordination.

DATA PROCESSING DIVISION

I. Present Status

Our review indicated that the present record-keeping operations and the supervision thereof were being conscientiously performed and all required statistics and information were made readily available to us. Many of the recommendations included in this report would be beneficial to the current operations and also under a merged organization. These recommendations are intended to be helpful and should not, in any way, be considered as adverse criticism of the record-keeping results now being obtained with present equipment facilities.

II. Data Processing

The current data processing of metered water and sewerage billing operations consists of International Business Machine computers located in the City and County of Baltimore. Anne Arundel County uses a Burroughs Sensimatic, Model 2100, on a manual system. The computers located in the City and County are utilized in conjunction with other data-processing applications. We have not attempted to define any procedures in detail as this could not serve a useful purpose at this time. Below are listed our comments on the current procedures where savings may be obtained.

A. Scheduling

Precise predetermined printed schedules covering all customers records operations in the office and on the street (meter reading and service orders) must be issued in advance for each quarter's business. This schedule is based on a cycle and book number for machine-made controls. A schedule of this type is included in the exhibits.

B. Accounts Receivable Control Records

Our proposed procedures would include complete mechanization of accounts receivable control records. All route controls would be produced as by-products of other detail machine operations, i.e. revenue, cash, etc. The machine-prepared controls would be used for balancing detail ledgers and to reconcile accounts receivable with the general ledger as part of the end of each fiscal month. Two types of controls would be utilized, descriptions of which follow.

Route Control

These are controls by each cycle and book number.

Source Control

Type of transaction entering the books.

Adaption of this type of mechanized control procedures would eliminate all present manual receivable controls prepared by the key-punch department.

A typical machine control report is included with the exhibits.

C. Meter Orders

Service order cut-ins and cut-outs are currently received on a weekly basis creating peak work loads. We recommend punched-card service orders eliminating the need to create the current 3/5 card on the computer. There are various types of punched-card service orders in use and we are including sample forms, illustrating a two-card approach which would replace the above mentioned 3/5 card.

Practically all entries to the address and billing cards will originate from the meter orders and, as entries once made in punched

cards will automatically repeat month after month, every practicable means of assuring accuracy at this point must be taken.

III. Meter Reading

We also recommend mark-sensed meter reading to reduce key-punching operations.

After all available orders are worked and in accordance with a precise schedule, the advance cards for each route would be sent to the Meter Reading Department immediately in advance of the reading day. Containers would be supplied to the meter readers who would be required to "mark" the current reading with a soft pencil in prescribed positions on the card. Meter readers would not enter subtractions on the card. Their "marks" will be converted by machine to punched holes so that manual key-punching will be avoided.

Mark-sensing is a proven method of meter reading used for millions of utility customers.

IV. Mechanized Cash Posting

The current method of posting cash to the customers account is a manual operation and we recommend this be converted to a computer operation. Cash-posting routines could be placed on a night operation basis and all customers' updated account information would be readily available on a daily basis.

Converting from the current manual system to a mechanical cash-posting operation has a large potential saving in personnel.

V. Cycle Balances

The current manual arrears procedure can be eliminated and processed on the computer if the above changes in procedures are adhered to.

VI. Manual Operation - Anne Arundel County

The current system of manual billing is outdated and with the number of bills being rendered (23,000 water, 19,000 sewer), some thought and planning should be initiated to convert to a mechanized system of billing. We anticipate a reduction of two or three personnel if this conversion is attained.

Merged Data Processing

All participants would be on a uniform billing, revenue, and cash-posting basis, with charges for the Data Processing Department prorated as to the number of customers billed.

The Data Processing Department would be essentially a group organized to serve all segments of the organization. Most of the data processing demands would originate within the accounting organization and since, for that reason, the department would be essentially producing records and reports, we advocate that it be included in Accounting with the Data Processing Manager reporting directly to the Treasurer.

Following are other mechanized applications that have been used successfully by many utilities in various phases of general accounting records. As our experience with this type of general accounting covers many companies, starting with one of the pioneer installations made in 1936, and the results have been invariably satisfactory, we have no hesitation in recommending completely mechanized operations covering practically every major phase of any general accounting record-keeping. Listed below are the applications for either current operations or a merger:

General ledger

Operating ledger

Plant ledger

Construction ledger

Voucher register

Journal register

Large volume journal entries, including some of the large volume underlying details, such as:

Labor distribution

Payroll

Equipment distribution

Stores issues and returns

Stores records - complete

Depreciation

Payroll analysis

Personnel records

Basic monthly financial report data

Operating budget comparisons

Construction budget comparisons

Cumulative auto cost analysis

Check reconciliation

All records of this type being proposed, including customer records, have been acceptable to independent auditors.

Classification and Coding

It has been found advisable in every instance to design an account and work order coding pattern to provide for the particular requirements of each specific utility. Properly designed account and work order numbers will permit direct machine development of the various total figures used in internal monthly reports.

Conversion of total data from internal accounts to standard accounts can be done rapidly by machine process when needed. Construction transactions would be identified only by work order number on base documents without plant account identification, until work orders are completed and being transferred to primary plant accounts. No control account identification would be used on any base document as the monthly control account totals would be developed and posted by machine. All transactions would be batch-controlled and balanced prior to entering the system.

Entries

All entries would be identified by a source code signifying the type of entry. Most of these source codes would be imprinted on the basic forms and require no manual insertion.

All entries would carry reference numbers, such as voucher, journal entry, stock issue ticket, employee, etc. All entries would carry alphabetic descriptions, most of which, with the exception of those coming from vouchers and miscellaneous journal entries, would be machine-made. Little reference to base documents for analysis purposes would be necessary.

All large-volume calculations such as stock ticket extensions, labor distribution extensions, overhead applications, equipment distribution extensions and so forth would be made and checked on the computer at high speeds.

Monthly Reports

Balance information with alphabetical account titles will be created automatically. All data would be machine-listed, as many copies as needed, in complete detail. Both monthly and cumulative totals would appear. Comparison with budgets and/or previous periods could be made.

Accuracy

Heavy emphasis must be placed on achieving accuracy in base documents before punching. Errors in original classification, however, would be controlled to the extent that transactions classified to nonexistent accounts or work orders would be rejected by the computer. All general accounting transactions would be proven before use. Simple manual summaries of all operations would be maintained to furnish all necessary control points for balancing each report before release.

Availability of Machine Made Reports and Records to Other Departments

The use of multi-copy, machine-made reports for distribution to other departments is a particularly effective management tool for cost control, estimating and analysis purposes. All information relating to each specific department can be made available to the department head for the cost of the additional paper used. This applies to construction as well as expense and income.

Stores Records

All stores records can be converted to machine operations. Several of the more important features of a machine stores operation are as follows:

1. Automatic pricing description and extension of all stores issues, returns and inventory adjustments.
2. Stores ledgers and distribution would be entirely machine-listed.
3. A tabulated end-of-the-month stores report would be prepared by machine and distributed to various departments. This report would indicate any stock items which are under prescribed minimums.
4. Detailed lists of stores items used on each construction or retirement work order would be machine-prepared.
5. Physical inventories would require no manual listings and over and short conditions would be developed automatically. Adjustments of such differences would be machine-priced and recorded.

6. Inventory control would be assisted by statistical segregation of materials by groups as well as in total. This, together with effective authorized stores minimums and maximums and the use of a Recurring Stores Purchase Requisition, would provide tools for the effective control of inventory.

Cataloging Stores Items

Before cataloging general supplies, we would determine those items to be treated as minor construction materials. Articles to be carried in general supplies should be cataloged by group and item numbers. The groupings should be decided upon jointly by the Engineering and Accounting Departments. A two-digit numeric coding can be used for "group" and a three-or four-digit numeric code would cover the items numbers. A one-digit numeric code would provide for the unit of issue such as, "each", "foot", "pound", etc.

The sequence of items within each group would be alphabetic and the sub-sequence within each alphabetic group would be size or other similar identification. Gaps in both the group and item numbers would be left for future expansion. One of the main objectives in cataloging stores is numbering so that any single item can logically appear only once and in proper sequence for ready reference without a cross index.

Bin Labels and Stock Tags

All bins carrying items included in supplies would carry bin labels or tags showing the following information:

Stock Number

Issue unit

Descriptions

Minimum balance

Color signals would be used to designate any reserve stock at another location and a second color signal to indicate outstanding purchase requisitions. Replenishment of stockroom items would originate from visual scanning of bins to compare with authorized minimums. When stock on hand is at the authorized minimum level, a Recurring Stores Purchase Requisition would be initiated by the storekeeper.

Recurring Stores Purchase Requisitions

A sample of a typical Recurring Stores Purchase Requisition is included in the exhibits. These card forms are held on file in the storeroom in stock number sequence. When the quantity of any item is at minimum, the Recurring Stores Purchase Requisition would be removed from the file and routed after approvals to the Purchasing Department for issuance of a purchase order. The following should be noted:

1. The permissible maximum quantity is shown.
2. The complete description exactly as it is to appear on the purchase order is shown.
3. Provision has been made for several vendors.
4. The storekeeper would show the quantity on hand and the quantity requisitioned to bring up to permissible maximum.
5. We favor approval of each stores requisition by the operating or engineering official most concerned with the use. At the same time changes in minimum balances would be included under such approvals, as minimums, unless constantly updated, are practically worthless.
6. The Purchasing Department would enter the purchase data called for and the storekeeper would enter material receipts on this form.

Current Month Transaction

Issues and returns to stock would be recorded originally on forms on which are printed the stock number and description of items used repeatedly. On such items the only manual entries required would be the quantity of each item and the account or work order to be charged. This would not only decrease the manual entries on stock slips but provide coding accuracy. In the case of less frequently used items, the stock number and description must be entered manually.

Physical Inventories and Overs/Shorts Adjustments

Physical inventories would be scheduled over the year by groups and all counts would be taken as of the month end. Punched inventory cards would be produced mechanically without quantities, interpreted, and forwarded to the various storerooms in advance of each inventory date. It would merely be necessary for the storekeeper to enter the quantity on hand at inventory date on these cards. No manual listings would be required.

At this time there would be available a balance card for each item in each stockroom. The physical inventory cards and related book balance cards would be combined for over and short conditions. This report would show the following information:

Description

Storeroom location

Stock number

Quantity per books

Quantity counted

Quantity difference

Unit Price

Major differences would be investigated and any necessary corrections made. In records for the month following the physical count, overs and shorts would be included in the mechanical pricing and extension operation.

Monthly Reports

Detail lists of issues, returns, etc., would be created by account or work order number at month end.

The monthly stores reports would be made on multi-copy forms, as required, with one copy to Engineering to keep them informed regarding stock status. Additional points of interest related to stores reports are:

1. All items under the authorized minimum would be indicated by an asterisk.
2. When required, the stock balance for individual items can be "aged" by the date of last issue or receipt. This will call attention to unused or obsolete items.

Conclusion

Our estimates are based on actual experience with similar conversions in many utilities and have been prepared on a conservative basis.

We have not tried to pinpoint potential savings in equipment or personnel because of the complexities of the different systems in operation. The counties and cities would be able to reduce equipment rental and personnel cost.

In arriving at this evaluation, we have given prime consideration to the provision of complete records for customer contacts and accurate billings so that public relations will be fully protected.

CONSOLIDATED COMPUTER INSTALLATION

PERSONNEL

No.	Title	Salary Annual	Salary Total
1	Manager	$12,500	$12,500
1	Assistant	9,500	9,500
1	Programmer	8,500	8,500
5	Machine Operators	5,000	25,000
7	Key-Punch Operators	4,000	28,000
3	Clerks	3,400	10,200
18			$93,700

The above personnel breakdown is for a data-processing system to process customer billing, stores records, general accounting, transportation, labor distribution and payroll for a consolidated water and sewerage operation.

As the number of water and sewer customers is growing, in all counties, at over 6,000 annually, we anticipate that under current methods it would be necessary to add an average of 2 record-keeping employees per year at the various offices. The average annual salary is approximately $4,800 per person for a total of $9,600. The above proposed installation would suffice through 1975 without an increase in personnel.

Specifications - Data Processing Equipment

System 360 - (32K)

Quantity	Model	Item	Monthly Rental
1	2030E	Central Processing Unit	$ 2,675
	3237	Decimal Arithmetic	25
	4427	Floating Point Arithmetic	50
	6960	Selector Channel	215
	7915	1051 Console Attachment	75
1	N1	1051 Console Control Unit	60
1	1	1052 Printer Keyboard	65
	3130	CPU Attachment	10
	4410	Console Attachment	5
	4411	Console Attachment	10
1	2540-1	Card Read Punch	660
	5890	Punch Feed Read	25
1	1403-N1	132 Print Positions 1100 LPM	900
4	2311	Disk Storage Drives @575	2,300
	2841-1	Storage Control Unit	525
1	1416-1	Interchangeable Train Carriage	100
1	2821-1	Control Unit	970
	3615	1100 LPM Printer Adopter	75
	5895	Punch Feed Read Control	55
		System 360 Computer Rental	8,800
6	024	Card Punches	240
2	056	Verifiers	90
1	083	Sorter	117
1	514	Reproducer	175
1	548	Interpreter	100
		Unit Record Equipment	722
		* Total System Monthly	$ 9,522
		Annual Rental	$114,264

* Disk-Storage packs for use on the 2311 disk-storage drives rent for $15 per month each or can be purchased outright for $490 each or the equivalent of about 33 months' rental cost. We estimate that at least 50 to 80 disk pack would be needed for all applications.

The above equipment would be available to the Engineering Department when needed.

The City of Baltimore would be able to reduce their current equipment rental costs, unless other applications were applied.

EXHIBITS

All exhibits in this section are typical rather than specific designs. These are arranged in sequence of mention in our report.

OPERATING SCHEDULE

CUSTOMER BILLING AND ACCOUNTING

Exhibit 1
Typical Schedule

(AUGUST 1958)

	1	4	5	6	7	8	11	12	13	14	15	18	19	20	21	22	25	26	27	28	29
COMPLETE ORDERS	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	01
COMPLETE METER READING	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21
PICK-UP ORDERS	-	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20
PRE-AUDIT	21	-	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19
KEY-PUNCH & KWH CHECK	20	21	-	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18
BILL EXTENSION	19	20	21	-	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
REVENUE REPORT	19	20	21	-	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
REPRODUCE ADVANCE CARDS	19	20	21	-	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
REVIEW LEDGER	20	21	-	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18
CYCLE BALANCE	19	20	21	-	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
BILL REGISTER	18	19	20	21	-	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
BILLS PREPARED - ISSUED	18	19	20	21	-	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
FINAL NOTICE EXPIRATION	09	10	13			14	15	18			19	20	01			02	03	06			07
		11					16					21					04				
		12					17										05				

CONTROL RECORDS

Exhibit 2
Typical Control
Record Form

SO.	CL.	BRANCH	ROUTE	FOLIO	CONTROL DATE	GEN. DATE	AMOUNT

SOURCES

COLL STATISTICS	12
RATE "	X
—	0
BILLING	1
BAL FORWARD	2
CASH & TRANSFERS	3
MISC. J.E. & VOUCHERS	4
DEPOSITS APPLIED	5
PENALTY BILLING	6
" ADJ.	7
NAME & ADDRESS	8
SERVICE ADDRESS	9

RECEIVABLE CLASS

SERVICE	1
MERCHANDISE	2

FORM 766

Exhibit 3
Typical Punched Card
Service Order
Master

CUSTOMER NUMBER | SERVICE ADDRESS | CITY | P.O. ZONE | METER NUMBER | METER-MAKE SIZE | DATE SET | MTR LOC | C L

GLOBE 206259

SERVICE ORDER

METER LOCATION | SCH

NAME | PHONE NO. | DATE TAKEN | DATE WANTED (A P)

RES. COML. IND.	A RANGE	B REFER	C AWH	C TWH	D HEAT	D A. HEAT	E DRYER	OTHER	NAT.	PROP.	1 ODOR	2 APPL. OUT	3 INSPECT	4 NEW APPL.	5 LIGHT	6 ADJUST	7 SHUT OFF	8 NO GAS	9 SEAS. T. O.	10 SEAS. S. O.	EMERG.

INSTRUCTIONS

TAKEN BY | TIME (A P) | DISPATCHED BY | TIME (A P)

WORKMANS REPORT

CGI | DATE | TIME | BY | L.C. | ODORANT | VENT | GREEN TAG WRITTEN ☐ | RED TAG WRITTEN ☐ | FOLLOW UP WRITTEN ☐ | MOSE ORDER WRITTEN ☐

METER FOUND (ON / OFF / LOCK) | METER LEFT (ON / OFF / LOCK) | READ | COMPLETED BY | COMPLETION DATE | TIME ARRIVED | TIME LEFT (A P)

CUSTOMER NUMBER (DST. 1 2 | RTE. 3 4 | ACCOUNT 5 6 7 8)	9	SERVICE ADDRESS 10–31	32	CITY 33–48	P.O. ZONE 49 50	51	METER NUMBER 52–57	58	METER SIZE AND MAKE 59–65	DATE SET MO. 66 67 | YR. 68 69	MTR. LOC. 70 71	C L 72 73	74	75	76 77 78 79 80

Exhibit 4
Typical Punched Card
Service Order

METER SET ORDER

CL. | SCH. | CC

DATE TAKEN	DATE WANTED			TAKEN BY	TIME	A P
HUSBAND - WIFE	DEPOSIT / NO DEPOSIT $ .00			DEPOSIT NO.		T F R
PHONE NO.	INSTRUCTIONS					
TYPE OF PREMISE	RANGE / REFER	A. W. H. / T. W. H.	HEAT / A. HEAT	OTHER	NAT	PROP.
METER NO.	MAKE - SIZE			METER LEFT ON OFF LOCK	SPOT	
METER LOCATION					CODE	
DATE COMPLETED	TIME A P	COMPLETED BY		PRESENT READ		
CUSTOMER NUMBER	METER BOOK					

SUF.	NAME			
	C/O NAME			
MAILING ADDRESS - STREET				
MAILING ADDRESS - CITY				ZONE
SERVICE ADDRESS				
CITY				ZONE

C G I	DATE	TIME	BY	LC

GLOBE 206953

Exhibit 7 - Typical Ledger Form

SOURCES

03 - Balance

PAYROLL

11 - Weekly
12 - Bi-weekly
13 - Semi-monthly
14 - Confidential
15 - Interim & Reversal
19 - Misc. Adjustments

TRANSPORTATION

21 - Distribution
29 - Misc. Adjustments

STORES

33 - Issues
34 - Returns
35 - Sales
36 - Sales Returns
37 - Inventory Adjustments
39 - Misc. Adjustments

ACCOUNTS PAYABLE

41 - Distribution
49 - Adjustments

CASH

51 - Receipts
52 - Disbursements
59 - Adjustments

MERCHANDISE

61 - Sales & Returns
65 - Commissions & Bonuses
69 - Misc. Adjustments

JOURNAL ENTRIES

70 - Closing Construction Orders
71 - Retirement of Plant
72 - Transfers/Adjustments of Plant
73 - Closing Retirement Orders
74 - Depreciation Provision
75 - Depreciation Transfers/ Adjustments
81 - Utility Service Sales
82 - Other Sales
83 - Stores Clearing

◀

90 - Miscellaneous

DESCRIPTION	MO.	YR.	SO.	REFERENCE	DEBITS	CREDITS	BALANCE	DEPT.	CODE	ACCOUNT	DIV.

FORM 133-24142

CONSTRUCTION AND RETIREMENT
WORK ORDER REPORT

Exhibit 8 - Typical Work Order Report

PAYROLL
Weekly
12 - Bi-weekly
13 - Semi-monthly
14 - Confidential
15 - Interim - Accrual & Reversal
19 Misc. Adjustments

TRANSPORTATION
21 - Distribution
29 - Misc. Adjustments

STORES
33 - Issues
34 - Returns
35 - Sales
36 - Sales Returns
37 - Inventory Adjustments
39 - Misc. Adjustments

ACCOUNTS PAYABLE
40 - Intercompany Bill
41 - Distribution
49 - Misc. Adjustments

JOURNAL ENTRIES
70 - Plant Additions
71 - Plant Retirements
Plant Transfers
73 - Closing Retirement Orders
74 - Depreciation Provisions
75 - Depreciation Transfers/ Adjustments
76 - Plant Adjustments
77 - General Overheads
83 - Stores Clearing
84 - Payroll Taxes
85 - Printing & Stationery
86 - Work Order Transfers
89 - Misc. Adj. - Others
90 - Miscellaneous

CODE
01 - Closing Construction
02 - Retirements
06 - Cost of Removal
07 - Salvage

DESCRIPTION	MO.	YR.	SO.	REFERENCE	AMOUNT				WORK ORDER			DIV.	CODE

RM 103-25142 2/62

AGL-764

W. O. DESCRIPTION

Exhibit 9 - Typical Work Order Ledger

CONSTRUCTION LEDGER

WORK ORDER NUMBER 9

SOURCE CODES

CARD CODES

01 - ACCOUNT TITLES
- BALANCE FORWARD
03 - FINANCIAL STATEMENT AND ESTIMATE

PAYROLL

11 - DIST. OPERATING
12 - DIST SALARY
13 - DIST. CONFIDENTIAL
14 - ACC/REV-BI WEEK
16 - ACC/REV-WEEK
18 - TAXES
19 - ADJUSTMENTS

TRANSPORTATION

21 - DISTRIBUTION
28 - ADJUSTMENTS

ACCOUNTS PAYABLE

31 - DISTRIBUTION
39 - ADJUSTMENTS

STORES

40 - BALANCES
. - PURCHASES
42 - TRANSFERS
43 - ISSUES
44 - RETURNS
45 - SALES
46 - SALES RETURNS
47 - ADJUSTMENTS
48 - OVERS-SHORTS
49 - INVENTORY

CASH

51 - RECEIPTS
52 - DISBURSEMENTS

SALES

81 - SERVICE REVENUE
88 - OTHER SALES
89 - MISC ADJUST

JOURNAL ENTRIES

71 - TRANSFER TO FIXED CAPITAL
74 - RETIREMENT OF PROPERTY
75 - STORES CLEARING
79 - OTHER JOURNAL ENTRIES

	DESCRIPTION	DATE MO	DATE YR	SOURCE	REFERENCE	WORK ORDER	AMOUNT

RECURRING STORES
PURCHASE REQUISITION

LOCATION _____ BIN LOCATION _____ STOCK NO. _____

Exhibit 10 - Recurring Stores Requisition

	VENDORS	CATALOG NUMBER
1		
2		
3		
4		

DESCRIPTION

CATALOG AND PURCHASE ORDER DESCRIPTION:

STANDARD PACKAGE NUMBER

UNIT

SHIP TO:

NORMAL SHIP VIA:

LOCATION INDEX Lyby. ☐ Roc. ☐ Rich. ☐ Chv. ☐ Phila. ☐ N. Y. ☐ Hunt. ☐ Log. ☐

	STOREKEEPER			OPERATIONS			PURCHASING							STOREKEEPER		
DATE	ON HAND	QUAN. REQ'D.	Stores Approval	MAX.	MIN.	Approval	Vendor	PRICE	PER	TERMS	F.O.B.	ORDER DATE	ORDER NUMBER	QUAN. REC'D.	DATE REC'D.	REC'D. BY

POPULATION

The population projections shown on Table Number 9, are the result of a careful study of the statistical data found in such sources as the U. S. Bureau of the Census and various reports prepared by consulting firms, the Regional Planning Council and local governmental agencies. Each of the principal areas in the Baltimore Region was studied separately and the final product was a summation of these individual estimates. The population in each of these areas has been experiencing a healthy growth rate except for the City of Baltimore. Here, the population has been decreasing. We have predicted that the population in the City of Baltimore will again increase before 1970.

In addition to a careful study of statistical data, a population projection should reflect factors which cannot be reduced to numbers. Some of these items which cause us to take an optimistic view of the future growth potential in Metropolitan Baltimore are the following:

1. Baltimore's strategic location in the transportation corridor of the rapidly expanding and developing megalopolis encompassing the region from Atlanta to Boston.
2. The abundance of usable land that is available for development in the Baltimore area.
3. The natural beauty and pleasant climate of the Baltimore Region.
4. Baltimore's diversified industrial activity and growth.
5. A proven record of good and effective administration at the various levels of government.

6. The availability of numerous institutions of higher education.

7. The last and probably the most important factor of all is the abundance of good water in the Baltimore Region.

The estimated average annual rate of growth for the period 1960 thru 1970 is 2.35%, with an over-all growth during the decade of 26%.

Table 9

METROPOLITAN BALTIMORE

TOTAL POPULATION DISTRIBUTION

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Baltimore County	492,400	515,800	520,500	523,800	531,800	550,000	570,000	585,000	610,000	625,000	640,000
Anne Arundel County	206,600	220,000	235,000	251,000	270,000	288,000	309,000	330,000	350,000	375,000	400,000
Howard County	36,000	38,900	41,800	44,700	47,600	50,500	54,000	57,000	59,500	62,500	65,000
Carroll County	52,800	53,500	54,200	55,000	56,000	57,000	57,500	58,000	59,000	60,000	61,000
Harford County	76,800	79,000	81,300	83,500	85,800	88,000	90,500	93,000	95,000	98,000	100,000
Suburban Total	864,600	907,200	932,800	958,000	991,200	1,033,500	1,081,000	1,123,000	1,173,500	1,220,500	1,266,000
Baltimore City	939,000	937,000	931,000	922,000	930,000	940,000	950,000	965,000	980,000	995,000	1 010,000
Area Total	1,803,600	1,844,200	1,863,800	1,880,000	1,921,200	1,973,500	2,031,000	2,088,000	2,153,500	2,215,500	2,276,000

POPULATION SERVED

Closely aligned with total population is the population receiving utility service as shown on Table Number 10. The utility services have been combined within the 6 major areas of the Region and represent water service. Sewer service would show slightly smaller figures in each instance. The coverage of an estimated 85% of the population is an excellent record. This reflects the accomplishments of the Baltimore City Water System which we have shown as rendering 100% coverage within the city limits. It should be noted that as the suburban population grows, there is a gradual dilution of this high percentage of coverage. This is recorded in the face of a healthy gain in customers in these outlying areas, and indicates the existing challenge to meet the increasing demand for water service in the area.

Table 10

METROPOLITAN BALTIMORE

POPULATION SERVED - DISTRIBUTION

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Baltimore County	420,400	432,500	442,600	455,400	465,400	482,400	501,000	514,800	538,000	553,100	568,300
Anne Arundel County	116,700	120,700	122,100	127,500	132,500	136,800	141,800	147,100	154,800	161,600	170,700
Howard County	8,700	10,000	11,400	12,700	14,100	15,400	17,200	18,800	20,200	21,900	23,400
Carroll County	15,000	15,600	16,300	16,900	17,600	18,200	18,900	19,300	20,100	20,900	21,700
Harford County	27,000	28,500	29,900	31,400	32,800	34,300	36,700	38,100	39,800	41,700	43,000
Suburban Total	587,800	607,300	622,300	643,900	662,400	687,100	715,600	738,100	772,900	799,200	827,100
Baltimore City	939,000	937,000	931,000	922,000	930,000	940,000	950,000	965,000	980,000	995,000	1,010,000
Area Total	1,526,800	1,544,300	1,553,300	1,565,900	1,592,400	1,627,100	1,665,600	1,703,100	1,752,900	1,794,200	1,837,100
Percent of Population Served	84.7%	83.7%	83.3%	83.3%	82.9%	82.4%	82.0%	81.6%	81.4%	81.0%	80.7%

CUSTOMERS AND RAW WATER DEMAND

Having estimated the population served, it is now possible to project the number of customers and the demand for raw water. The term raw water is the gross amount of water required before system losses and nonrevenue uses. It is usually measured in MGD (million gallons per day). Using the years 1960 through 1964, we calculated the (GPCD), average daily use per capita of population serviced, for each of the areas in Metropolitan Baltimore. The historical trend is an increase in GPCD and we expect this to continue. A number of factors contribute to GPCD such an industrial consumption and other nonresidential usage. The average residential consumer is also requiring more water, as the saturation of washing machines, dishwashers and swimming pools rises.

The increase in population serviced and water demands can be seen in area totals, as follows:

	1960	1970
Population Served	1,526,800	1,837,100
Average Daily Demand (MGD)	221.4	296.7
Average Per Capital Consumption (GPCD)	145.0	161.5

Table 11

METROPOLITAN BALTIMORE

CUSTOMER DISTRIBUTION - WATER

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Baltimore County	109,200	112,300	115,000	118,300	120,900	125,300	130,500	134,100	140,100	144,400	148,400
Anne Arundel County	29,200	30,300	30,600	32,000	33,200	34,400	35,700	37,200	39,200	41,200	43,700
Howard County	2,100	2,400	2,700	3,100	3,400	3,700	4,100	4,500	4,900	5,300	5,700
Carroll County	3,600	3,800	4,000	4,100	4,300	4,500	4,600	4,800	5,000	5,200	5,400
Harford County	6,400	6,800	7,200	7,500	7,900	8,300	8,900	9,200	9,700	10,200	10,500
Suburban Total	150,500	155,600	159,500	165,000	169,700	176,200	183,800	189,800	198,900	206,300	213,700
Baltimore City	226,000	224,700	224,500	222,600	221,400	221,200	220,400	220,100	219,900	219,500	219,000
Area Total	376,500	380,300	384,000	387,600	391,100	397,400	404,200	409,900	418,800	425,800	432,700

Table 12

METROPOLITAN BALTIMORE
RAW WATER DEMAND - DISTRIBUTION
AVERAGE DAILY CONSUMPTION - MILLION GALLONS DAILY

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Baltimore County	43.1	44.2	49.8	53.0	57.2	61.3	65.7	69.6	74.9	79.3	83.8
Anne Arundel County	8.5	9.2	9.9	10.6	11.3	12.2	13.1	14.0	15.3	16.5	18.0
Howard County	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.3	1.4	1.5	1.7
Carroll County	1.5	1.6	1.6	1.7	1.7	1.8	1.9	1.9	2.0	2.1	2.2
Harford County	1.9	2.1	2.2	2.3	2.5	2.6	2.8	3.0	3.1	3.3	3.4
Suburban Total	55.5	57.7	64.2	68.4	73.6	78.9	84.6	89.8	96.7	102.7	109.1
Baltimore City	165.9	166.9	165.1	168.6	167.7	170.4	173.1	176.7	180.3	184.0	187.6
Area Total	221.4	224.6	229.3	237.0	241.3	249.3	257.7	266.5	277.0	286.7	296.7

RATES AND REVENUES

Revenue Producing Methods

There exists in the various water and sewer utilities in the Baltimore Region a number of methods of raising revenues. A description of each of these methods follows:

A. Water Service Revenues

1. Flat rates for unmetered customers - This is a form of rate which is usually a carry-over from early water works practices when the water supply was abundant and costs were relatively low. The flat rate in the Baltimore area is based on factors such as the width of the lot, the number of fixtures, the number of families in a building and number of individual connections. Experience has shown that this is not a fair or equitable method of spreading cost and that it often encourages waste of water. The bulk of unmetered customers remain in the older sections of Baltimore City and an active program has been in effect for a number of years to install meters on all of these services.

2. Block Rate with Minimum Based on Meter Size - This is the most common rate in effect throughout the Region. It provides for a decreasing rate as the volumetric consumption increases. The minimum charge is based on the installed meter size. An example of this type of rate is the metered rate in effect in the City of Baltimore.

First 5,000 Cubic Feet per quarter @ $2.50 per 1,000 Cubic Feet
Next 45,000 Cubic Feet per quarter @ $2.50 per 1,000 Cubic Feet
Over 50,000 Cubic Feet per quarter @ $1.00 per 1,000 Cubic Feet

Minimum Quarterly Charge based on meter size.

3. Fire Protection - No uniform practice appears to exist in the Region for charges for fire protection. Practices vary from a flat annual charge to service under existing metered rate schedules.

4. Front-Foot Assessments - This is a common revenue producing practice outside of Baltimore City. The purpose of this type assessment is to distribute the cost of debt service on an equitable basis to those customers affected by extension of the existing system. This assessment originally was based on the life of the financing method, but there seems to be a tendency to continue the assessment after the debt has been satisfied.

5. Local Taxes - In a number of cases the water utility's operations are subsidized from general tax funds. Property taxes therefore become a contributing factor in meeting revenue requirements. Recent legislation in Anne Arundel County [1] has contained the provision that the operations of water and sewer utilities must be self-supporting. In such a case local taxes will cease to be a source of revenues.

6. Area Charges - This is sometimes called a 'benefit assessment' or area service charge and is usually added to the customer's tax bill. The normal purpose of this type charge is usually a quick expedient to prevent a financial deficit or eliminate the necessity of increasing rates.

7. Connection Charges - These are charges made by the utility to the customer for connecting his water or sewer service. The charge is usually based on the experience of the previous year's expenses or on a set fee sufficient to cover the related costs.

1 Article VII Section 717, Revised County Charter

B. Sewer Service Revenues

1. Percentage of Metered Water Charges - This is the most common sewer rate application in the Baltimore Region. It is generally considered the fairest distribution of charges, since the volume of sewage is normally directly related to water consumption. There are a few exceptions which merit relief under this type of rate such as agricultural usage.

2. Number and Type of Fixtures and Appliances - This method requires an inventory of fixtures and equipment in use by each customer. Each of these items is weighted according to its contribution to the sewage load and the sewer bill is based on the resulting weighted point total. This method is in use in Baltimore County. Satisfactory administration of this type rate requires inspection and constant surveillance to assure complete and equitable billing.

3. Items (4) through (6) in section A apply in the same manner to sewage works.

General Comments On Rates And Revenues

After studying the various methods used to satisfy the revenue requirements for the water and sewer utilities in the Baltimore Region, the following conclusions and suggestions are made:

1. Comparison of rates is practically meaningless due to the disproportionate effect of the other sources of revenue in the various utility operations. In other words, a low rate often indicates higher assessments and vice versa.

2. The methods used to produce revenues usually revert to an honest attempt to relate income to expenses. Historically, rates were

designed to cover the total cost of service. Assessment charges were instituted to relate additional debt service cost to the responsible and benefiting individuals. Local taxes and area charges were usually added to prevent rate increases. None of these methods are patently unfair, but with the constant desire to keep rates as low as possible, these methods had gradually lost their revenue and expense relationship. In most cases existing water and sewer rates are too low.

3. Our recommendation as to a solution to these problems would be a cost of service study which we will describe in a later section.

Our study of the numerous water and sewer rates that are now in effect in the area has resulted in the following apparent weaknesses. If an over-all commission is established, these weaknesses should be corrected in the merger. In the event that no merger takes place, they may merit corrective action by the agencies concerned.

1. The published rate schedule for Baltimore County customers on Metropolitan-owned mains is the following:

First	5,000 cubic feet per quarter	@$1.50 per 1,000 cubic feet	
Next	95,000 " " " "	@$1.30 " " " "	
Next	900,000 " " " "	@$1.20 " " " "	
Over	1,000,000 " " " "	@$1.00 " " " "	
Over	12,000,000 " " " "	- all charged at $1.00 per 1,000 cubic feet. No sliding scale.	

Under this schedule a situation exists where a customer using 12,000,000 cubic feet would be billed $12,211 under the first 4 steps in the rate. This same customer could use 12,000,001 cubic feet or 1 additional cubic foot and his bill would be $12,000 under the provision of the 5th step of the rate. The additional use of 1 cubic foot therefore results in a saving of $211. An increase in consumption should not produce a reduction in the total bill.

2. The rates for and revenues derived from fire protection service appear too low. This conclusion is based on the relatively small percentage of revenue resulting from this service as well as charges in effect in other areas. The present policy of allowing usage of water for normal consumption through fire protection services is also a questionable practice.

3. The existing sewer rates at present are basically related to volume. In addition to volumetric charges, we believe that a provision should be included in the rate whereby a customer who is discharging into the system sewage which is unusually difficult to treat would be subject to a surcharge. Such a provision does not have to apply to all sewage but only where treatment requirements are, suspected to be abnormally high. A variety of industrial and processing wastes could be considered in this category.

Cost-Of-Service Study

What is meant by a "Cost-of-Service Study"? Basically it is a detailed study involving each expense item in the total cost of rendering a service. Each item is allocated to its respective class of service and geographical area. The final result indicates the cost to serve a particular class of customer in a given area of the system. If a merger is accomplished, it would be most desirable to have uniform rates throughout the system. A cost-of-service Study would indicate any inequities in the establishment of uniform rates. The final use of the results of a cost-of-service study would also constitute the basis for the design of rates to produce revenues sufficient to cover the total cost of operating the merged system.

In the five counties surrounding Baltimore and the city itself, there exist approximately 25 different water rates and roughly a similar number for sewage service.

In addition there is an assortment of miscellaneous charges for everything for service to a vacant lot to cleaning a clogged sewer. The remaining revenue requirements are satisfied by a variety of assessments, taxes and connection charges.

In the event of a merger of all these activities, it would be necessary to reduce this multitude of charges to as few as possible. This consolidation, however, creates a number of questions that deserve answers. Some of these questions are:

1. Is a uniform rate for metered water service fair and equitable to customers in all areas of the Region?
2. Is a uniform sewer rate equitable?
3. What percentage of the total costs should be supported by such services as fire protection, sewer, etc.?
4. What charges should be assessed as minimums for each of the meter sizes?
5. What will be the basis for future main extension?

We strongly recommend the use of a cost-of-service study to resolve the previously mentioned problems. It is also appparent that such a study would be of fundamental value to the presently existing water and sewer operations in meeting their current problems.

Statement 8

METROPOLITAN BALTIMORE

TYPICAL WATER BILLS

Quarterly Consumption		Baltimore County		Baltimore City and Howard County	City of Annapolis				Anne Arundel County	
		City Owned Mains	Metropolitan Owned Mains		City		Outside City			Balto. City Owned Mains
Mcf	M Gallons	Rate B	Rate M	Rate C	Regular	Wholesale	Regular	Wholesale	Anne Arundel Sanitary Comm.	Rate AA
1	7.48	$ 3.65	$ 2.00	$ 2.50	$ 6.51	$ 6.51	$ 9.77	$ 9.77	$ 5.69	$ 4.50
2.67	20	6.68	4.01	6.68	6.51	6.51	9.77	9.77	10.20	12.02
5	37.40	12.50	7.50	12.50	11.56	11.56	17.60	17.60	16.46	22.50
10	74.80	21.00	14.00	20.00	22.40	22.40	34.43	34.43	29.93	33.75
13.37	100	26.73	18.38	25.06	29.71	29.71	45.77	45.77	39.00	41.33
50	374	89.00	66.00	80.00	109.17	109.17	169.07	169.07	112.98	123.75
66.84	500	117.63	87.89	96.84	145.71	145.00	225.77	225.00	147.00	149.01
100	748	174.00	131.00	130.00	217.63	204.52	337.37	314.28	213.96	198.75
133.68	1,000	214.42	171.42	163.68	290.71	265.00	450.77	405.00	282.00	249.27
250	1,870	354.00	311.00	280.00	543.01	473.80	842.27	718.20	464.70	423.75
500	3,740	654.00	611.00	530.00	1,085.31	922.60	1,683.77	1,391.40	857.40	798.75
1,000	7,481	1,254.00	1,211.00	1,030.00	2,170.20	1,820.44	3,367.22	2,738.16	1,643.01	1,548.75
10,000	74,805	12,054.00	10,211.00	10,030.00	21,694.16	17,978.20	33,663.02	26,974.80	15,781.05	15,048.75
12,000	89,766	14,454.00	12,211.00	12,030.00	26,032.85	21,568.84	40,395.47	32,360.76	18,922.86	18,048.75
25,000	187,013	30,054.00	25,000.00	25,030.00	54,234.48	44,908.12	84,156.62	67,369.68	39,344.73	37,548.75
50,000	374,026	60,054.00	50,000.00	50,030.00	108,468.25	89,791.24	168,312.47	134,694.36	78,617.46	75,048.75
100,000	748,052	120,054.00	100,000.00	100,030.00	216,935.79	179,557.48	336,624.17	269,343.72	157,162.92	150,048.75

Statement 9

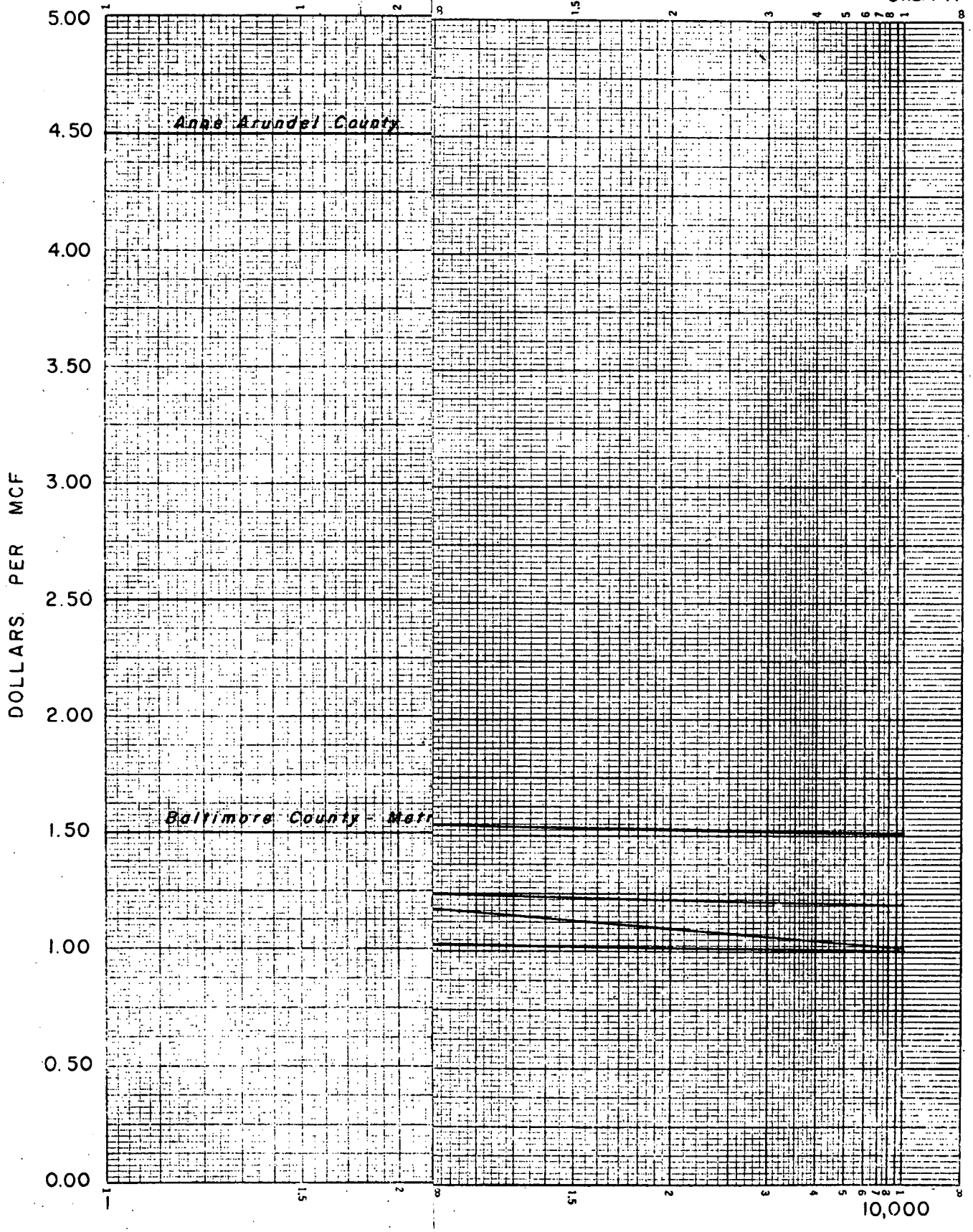
METROPOLITAN BALTIMORE

TYPICAL WATER BILLS (CONTINUED)

Quarterly Consumption		Carroll County							Harford County			
Mcf	M Gallons	Westminister	Hampstead	Manchester	Taneytown	Union Bridge	New Windsor	Mount Airy	Havre De Grace	Aberdeen	Harford Co. Metro Com.	Bel Air
1.00	7.48	$ 6.21	$ 5.65	$ 4.74	$ 4.49	$ 5.24	$4.00	$ 7.00	$ 8.50	$ 6.00	$ 12.00	$ 11.93
2.67	20.00	15.50	12.50	8.50	11.00	13.00		11.65	15.50	14.75	18.30	25.46
5.00	37.40	25.37	21.33	12.85	18.96	23.44		21.05	27.68	25.19	33.96	44.33
10.00	74.80	40.88	36.37	22.20	31.70	44.10		39.46	51.38	47.63	67.62	84.83
13.37	100.00	49.45	45.45	28.50	38.00	56.20		50.80	66.50	62.75	90.30	112.13
50.00	374.00	134.41	138.87	70.90	106.50	142.00		160.60	197.30	227.15	336.90	408.83
66.84	500.00	170.95	180.45	89.80	138.00	179.80		211.00	254.00	302.75	450.30	545.23
100.00	748.00	239.91	260.81	127.00	200.00	254.20	Flat Rate $4.00/Connection	310.20	365.60	451.55	673.50	813.83
133.68	1,000.00	306.95	340.45	164.80	263.00	329.80		411.00	479.00	602.75	825.30	1,086.64
250.00	1,870.00	498.95	603.45	295.30	480.50	590.80		759.00	870.50	1,124.75	1,347.30	2,028.83
500.00	3,740.00	872.95	1,164.45	575.80	948.00	1,151.80		1,507.00	1,712.00	2,246.75	2,469.30	4,053.83
1,000.00	7,481.00	1,621.15	2,286.75	1,136.95	1,883.25	2,274.10		3,003.40	3,395.45	4,491.35	4,713.90	8,103.83
10,000.00	74,805.00	15,085.95	22,483.95	11,235.55	18,714.25	22,471.30		29,933.00	33,691.25	44,885.75	45,108.30	81,003.83
12,000.00	89,766.00	18,078.15	26,972.25	13,479.70	22,454.50	26,959.60		35,917.40	40,423.70	53,862.35	54,084.90	97,203.83
25,000.00	187,013.00	37,527.55	56,146.35	28,066.75	46,766.25	56,133.70		74,816.20	84,184.85	112,210.55	112,433.10	202,503.83
50,000.00	374,026.00	74,930.15	112,250.25	56,118.70	93,519.50	112,237.60		149,621.40	168,340.70	224,418.35	224,640.90	405,003.83
100,000.00	748,052.00	149,735.35	224,458.05	112,222.60	187,026.00	224,445.40		299,231.80	336,652.40	448,833.95	449,056.50	810,003.83

BALTIMORE CITY

Chart 17



FORECAST OF OPERATIONS

FORECAST OF OPERATIONS

Determination of Revenues

The projection of customers and their related consumptions leads to the problem of determining the revenues to be derived from a given rate. If the average use of all customers remained constant, we could divide the total revenue by the total consumption and the result would be a unit rate. This unit rate could then be multiplied by the new consumption and we would have accurately determined the new revenue figure. Unfortunately, the average use does not remain constant, and the unit rate is an unreliable method of projecting revenues. In most cases the average use is increasing and this increase forces more consumption into the lower steps of the rate.

The best method of determining the consumption in each rate block for a projected period is through the use of a Cumulative Frequency Curve or, as it is sometimes called, an Ogive Curve. This curve is normally developed from a bill analysis. A bill analysis is a count of all the bills and their related consumptions for each of a series of levels throughout the range of use. After discussing the availability of such a bill analysis with members of the Machine Accounting Department of the City of Baltimore, it was found that only two billing periods would be available. It was decided that this would not be a representative sample since it did not include the higher summer consumptions.

Lacking appropriate bill analysis data, we proceeded to develop a Synthetic Cumulative Frequency Curve for each of the eleven different meter sizes. These synthetic curves were developed from a family of curves of typical residential, commercial and industrial usage. The accuracy of each of the curves is measured by calculating the revenues for a given group of customers where the consumption and revenue are known. The calculated revenue can then be compared with the

known revenue and a percentage of error determined. The test year in this study was 1964 and the results produced from the synthetic curves proved remarkably accurate. Revenues were then computed for each of the five years of projections for each of the eleven sizes and each rate. While this is a lengthy and tedious procedure, we are convinced that it is the most accurate method of calculating revenues not only for forecasted periods but for purposes of rate changes.

In addition to the calculation of revenues for each rate and meter size, we individually analyzed the other revenue accounts. The projection of each of these accounts was based on historical trends plus other anticipated factors.

Expenses of Operation and Maintenance

Where it was deemed of use in estimating with a greater degree of accuracy, we analyzed stem accounts such as general expense, operating expense, maintenance expense, operation and maintenance of pumping plants, etc., rather than the total figure for the utility. These accounts were analyzed for their historical relationship to average customers served, water volume handled or simply their average rate of growth over the past six years. The relationship with the better pattern (providing it had a physical relationship as well) was trended into the future in line with estimated customer growth, water use and inflation. Our determination of the present state of the physical plant and the maintenance standards thereof also entered into the process.

The very small units were treated in the same general manner but by using total operation and maintenance expense.

Construction Program

Wherever possible we have taken the proposed six-year capital budget of each individual utility. In the case of the Bureau of Water Supply we were forced to allocate the six-year total to an assumed year or years for each project.

Two utilities had long-range plans without indication of specific expenditure by year, giving instead a total figure before 1980 and a total figure before 2000. Here again we made our own estimate of the timing of these programs to obtain figures for the period of the forecast. Knowing the past history of the area and having estimates of substance covering its future growth, we believe in all instances that the total regional capital-spending estimate is reasonable.

Capital Financing

We have totally disregarded State and Federal grants or loans as a possible source of funds. Obviously some, possibly many, dollars will be ultimately obtained. The amounts to be applied for, the amounts likely to be granted, and above all, the years in which the money would be obtained are highly uncertain. Conservative forecasting forces us to ignore this avenue of funds and assume that the required financing will be 100% debt, except for the relatively small amounts of cash appropriated each year for minor construction, which we have continued at their recent levels.

New financing needed to meet capital requirements during the period July 1, 1965 to June 30, 1970 is estimated at $193,400,000. The requirements, by fiscal years ending June 30, are:

	Thousands of Dollars
1966	$ 26,800
1967	43,100
1968	45,700
1969	41,500
1970	36,300
	$193,400

All financing is projected as being through sale of 30-year general obligation bonds, with repayment provisions being patterned generally on past experience of the respective issuers. Based on current yields for municipal securities, we have

assumed that effective interest rates on new financing, if done at the present time, would be approximately 3.35% for Baltimore County, 3.625% for Anne Arundel County and 3.50% for Baltimore City and the other cities and counties included in our study. These interest rates have been used to estimate financing for the respective systems throughout the projected period.

Operating Results

Statements 10 through 15 inclusive, present the forecasted operating results of the six groups of utilities for the fiscal years 1966 through 1970. These results are based on a complete continuation of operations as they are now; no savings due to individual reorganizations have been included. (A summary comparative listing of these six statements appears on Statement 1, following page 90.)

Statement 16 presents the regional total income statement for continued as-is operation on a consolidated basis, i.e., with interutility contra charges and revenues removed to arrive at real revenues and expenses on a net dollar input-output basis.

Integrated Operations

Statement 17 reflects estimated results of operations of an integrated system under Commission ownership.

Future capital requirements of the integrated system were estimated to be provided partly from revenues from customers, with the balance to be realized through sale of 30-year revenue bonds to be extinguished by semi-annual payments in equal amounts to cover both principal and interest. Total estimated capital requirements and the amounts to be derived from each of the above sources are:

	Thousands of Dollars		
	From Service Revenues	From Sale of Bonds	Total
Fiscal 1966	$ -	$ 26,600	$ 26,600
1967	2,600	40,300	42,900
1968	3,100	42,400	45,500
1969	3,800	37,500	41,300
1970	4,500	31,600	36,100
	$14,000	$178,400	$192,400

After discussion with several municipal bond experts, we assumed that water and sewer revenue bonds in the Baltimore area would carry an effective interest rate of about 1/8% more than would general obligation bonds of the city of Baltimore. Therefore, we have used an interest rate of 3.625% on all bonds estimated to be sold by the Commission during the projected period.

Further assumptions made as a result of our discussions and research are:

1. That, with respect to revenue bonds of the Commission, a one and one-half times earnings coverage of maximum annual debt service requirements would be required for issuance of additional bonds.
2. That a "Bond Reserve Fund" equal to the succeeding year's principal and interest requirements on all bonds sold by the Commission would have to be maintained.
3. That all revenues in excess of operating expenses, debt service and "Bond Fund" requirements would be used for water and sewer construction.

The savings in operating and maintenance costs that are estimated for the Commission are similar to those on page 72 of the report, with the exception of those listed for construction and financing, which are factored into the financing program

just described. (It should be noted that the page 72 savings are as of calendar year 1965, while Statement 17 is on a fiscal year basis.)

We assume that all existing debt will be taken as an obligation of the CMSC. The low rates enjoyed by the earlier issues are such that no advantage would be realized by refunding them. Legal obstacles, particularly in the case of the City's debt, are also prohibitive.

CITY OF BALTIMORE
BUREAUS OF WATER SUPPLY AND SEWERS
ESTIMATED REVENUES AND REVENUE REQUIREMENTS
FOR FISCAL YEARS ENDING JUNE 30, 1966 THRU 1970

(Thousands of Dollars)

	1966	1967	1968	1969	1970
Revenues:					
Water and Sewer Service Charges (1)	$17,750	$18,371	$19,070	$19,793	$20,492
Local Water and Sewerage Taxes					
Sewer Treatment Revenue (2)	650	663	677	691	705
Miscellaneous Revenue	182	180	178	176	174
Total Revenues	18,582	19,214	19,925	20,660	21,371
Operating Expenses	9,093	9,484	9,909	10,354	10,877
Net Revenues	9,489	9,730	10,016	10,306	10,494
Other Receipts:					
Front Foot Assessments					
House Connection Charges	500	500	500	500	500
Deficits and Area Service Charges					
Miscellaneous Receipts	2	2	2	2	2
Total Other Receipts	502	502	502	502	502
Available for Debt Service, etc.	9,991	10,232	10,518	10,808	10,996
Debt Service:					
Interest	3,625	3,669	3,803	3,864	3,863
Redemptions	5,679	5,843	5,757	5,873	6,579
Total Debt Service	9,304	9,512	9,560	9,737	10,442
Available for Construction, etc.	$ 687	$ 720	$ 958	$ 1,071	$ 554

(1) Excludes $300,000 estimated annual payment to County.

(2) Includes income from Baltimore and Anne Arundel Counties.

Statement 11

BALTIMORE COUNTY
METROPOLITAN DISTRICT
ESTIMATED REVENUES AND REVENUE REQUIREMENTS
FOR FISCAL YEARS ENDING JUNE 30, 1966 THRU 1970

(Thousands of Dollars)

	1966	1967	1968	1969	1970
Revenues:					
Water and Sewer Service Charges (1)	$4,236	$4,485	$4,757	$5,048	$ 5,313
Local Water and Sewerage Taxes					
Sewer Treatment Revenue					
Miscellaneous Revenues	36	37	39	41	43
Total Revenues	4,272	4,522	4,796	5,089	5,356
Operating Expenses	3,276	3,579	3,869	4,204	4,630
Net Revenues	996	943	927	885	726
Other Receipts:					
Front Foot Assessments	3,630	3,812	4,010	4,223	4,410
House Connection Charges	2,000	2,000	2,000	2,000	2,000
Deficits and Area Service Charges	250	250	250	250	250
Miscellaneous Receipts	143	143	143	143	143
Total Other Receipts	6,023	6,205	6,403	6,616	6,803
Available for Debt Service, etc.	7,019	7,148	7,330	7,501	7,529
Debt Service:					
Interest	2,774	3,093	3,443	3,800	4,123
Redemptions	3,156	3,533	3,939	4,424	4,997
Total Debt Service	5,930	6,626	7,382	8,224	9,120
Available for Construction, etc.	$1,089	$ 522	$ (52)	$ (723)	$(1,591)

(1) Includes $300,000 per year from the city.

Statement 12

ANNE ARUNDEL COUNTY AND ANNAPOLIS
DEPARTMENT OF PUBLIC WORKS - WATER AND SEWER SERVICES
ESTIMATED REVENUES AND REVENUE REQUIREMENTS
FOR FISCAL YEARS ENDING JUNE 30, 1966 THRU 1970

(Thousands of Dollars)

	1966	1967	1968	1969	1970
Revenues:					
Water and Sewer Service Charges	$2,592	$2,743	$2,930	$ 3,137	$ 3,368
Local Water and Sewerage Taxes	376	398	426	448	470
Sewer Treatment Revenue					
Miscellaneous Revenues	51	51	51	51	51
Total Revenues	3,019	3,192	3,407	3,636	3,889
Operating Expenses	1,730	1,849	1,979	2,142	2,300
Net Revenues	1,289	1,343	1,428	1,494	1,589
Other Receipts:					
Front Foot Assessments	1,265	1,358	1,465	1,588	1,725
House Connection Charges	463	495	532	575	623
Deficits and Area Service Charges	184	195	210	225	244
Total Other Receipts	1,912	2,048	2,207	2,388	2,592
Available for Debt Service, etc.	3,201	3,391	3,635	3,882	4,181
Debt Service:					
Interest	1,130	1,733	2,271	2,774	3,138
Redemption	996	1,336	1,916	2,566	3,117
Total Debt Service	2,126	3,069	4,187	5,340	6,255
Available for Construction, etc.	$1,075	$ 322	$ (552)	$(1,458)	$(2,074)

Statement 13

CARROLL COUNTY MUNICIPALITIES AND SANITARY COMMISSION
WATER AND SEWER SERVICES
ESTIMATED REVENUES AND REVENUE REQUIREMENTS
FOR FISCAL YEARS ENDING JUNE 30, 1966 THRU 1970

(Thousands of Dollars)

	1966	1967	1968	1969	1970
Revenues:					
Water and Sewer Service Charges	$341	$353	$ 368	$ 383	$ 398
Local Water and Sewerage Taxes					
Sewer Treatment Revenue					
Miscellaneous Revenues					
Total Revenues	341	353	368	383	398
Operating Expenses	207	247	246	270	297
Net Revenues	134	106	122	113	101
Other Receipts:					
Front Foot Assessments					
House Connection Charges					
Deficits and Area Service Charges					
Total Other Receipts					
Available for Debt Service, etc.	134	106	122	113	101
Debt Service:					
Interest	69	83	141	230	324
Redemptions	9	59	88	177	270
Total Debt Service	78	142	229	407	594
Available for Construction, etc.	$ 56	$(36)	$(107)	$(294)	$(493)

Note: The municipalities set forth herein are Manchester, Mt. Airy, Hampstead, New Windsor, Taneytown, Union Bridge, and Westminster.

Statement 14

HOWARD COUNTY METROPOLITAN COMMISSION
WATER AND SEWER SERVICES
ESTIMATED REVENUES AND REVENUE REQUIREMENTS
FOR FISCAL YEARS ENDING JUNE 30, 1966 THRU 1970

(Thousands of Dollars)

	1966	1967	1968	1969	1970
Revenues:					
Water and Sewer Service Charges	$ 196	$ 212	$ 232	$ 252	$ 272
Local Water and Sewerage Taxes	280	300	320	340	360
Sewer Treatment Revenues					
Miscellaneous Revenues	42	43	45	46	47
Total Revenues	518	555	597	638	679
Operating Expenses	266	303	338	377	413
Net Revenues	252	252	259	261	266
Other Receipts:					
Front Foot Assessments					
House Connection Charges	41	44	44	44	44
Deficits and Area Service Charges					
Miscellaneous Receipts					
Total Other Receipts	41	44	44	44	44
Available for Debt Service, etc.	293	296	303	305	310
Debt Service:					
Interest	338	435	515	627	748
Redemptions	157	357	428	551	694
Total Debt Service	495	792	943	1,178	1,442
Available for Construction, etc.	$(202)	$(496)	$(640)	$(873)	$(1,132)

Statement 15

HARFORD COUNTY METROPOLITAN COMMISSION AND MUNICIPALITIES
WATER AND SEWER SERVICES
ESTIMATED REVENUES AND REVENUE REQUIREMENTS
FOR FISCAL YEARS ENDING JUNE 30, 1966 THRU 1970

(Thousands of Dollars)

	1966	1967	1968	1969	1970
Revenues:					
Water and Sewer Service Charges	$645	$ 684	$ 709	$ 746	$ 776
Local Water and Sewerage Taxes					
Sewer Treatment Revenue					
Miscellaneous Revenues					
Total Revenues	645	684	709	746	776
Operating Expenses	388	433	465	508	553
Net Revenues	257	251	244	238	223
Other Receipts: (1)					
Front Foot Assessments					
House Connection Charges					
Deficits and Area Service Charges					
Total Other Receipts					
Available for Debt Service, etc.	257	251	244	238	223
Debt Service:					
Interest	251	328	400	436	495
Redemptions	100	150	257	303	342
Total Debt Service	$351	$ 478	$ 657	$ 739	$ 837
Available for Construction, etc.	$(94)	$(227)	$(413)	$(501)	$(614)

Note: The municipalities set forth herein are Bel Air, Aberdeen, and Havre De Grace.

(1) Other receipts are included with service charges.

Statement 16

CONSOLIDATED REGIONAL WATER AND SEWER UTILITIES
ESTIMATED REVENUE AND REVENUE REQUIREMENTS

(Expressed in Thousands of Dollars)

	Fiscal Years Ending June 30,				
	1966	1967	1968	1969	1970
Revenues -					
Water and Sewer Service Charges	$25,604	$26,660	$27,836	$29,076	$30,276
Local Water and Sewerage Taxes	656	698	746	788	830
Sewer Treatment Revenue	85	88	92	96	100
Miscellaneous Revenues	303	303	305	306	307
Total Revenues	26,648	27,749	28,979	30,266	31,513
Operating Expenses	14,231	15,124	15,983	16,969	18,114
Net Revenues	12,417	12,625	12,996	13,297	13,399
Other Receipts -					
Front Foot Assessments	4,895	5,170	5,475	5,811	6,135
House Connection Charges	3,004	3,039	3,076	3,119	3,167
Deficits and Area Service Charges	434	445	460	475	494
Miscellaneous Receipts	145	145	145	145	145
Total Other Receipts	8,478	8,799	9,156	9,550	9,941
Available for Debt Service, etc.,	20,895	21,424	22,152	22,847	23,340
Debt Service -					
Interest	8,187	9,341	10,573	11,731	12,691
Redemptions	10,097	11,278	12,385	13,894	15,999
Total Debt Service	18,284	20,619	22,958	25,625	28,690
Available for Construction, etc.	$ 2,611	$ 805	$ (806)	$(2,778)	$(5,350)

CENTRAL MARYLAND SANITARY COMMISSION
ESTIMATED REVENUE AND REVENUE REQUIREMENTS

(Expressed in Thousands of Dollars)

	Fiscal Years Ending June 30,				
	1966	1967	1968	1969	1970
Revenues	$36,833	$40,961	$43,914	$47,123	$51,417
Operating Expenses	13,795	14,671	15,513	16,481	17,607
Net Revenues	23,038	26,290	28,401	30,642	33,810
Income From Investments	502	713	933	926	888
Available For Debt Service, etc.	23,540	27,003	29,334	31,568	34,698
Debt Service - Assumed Debt:					
Interest	7,900	7,618	7,326	7,042	6,761
Redemptions	10,126	10,376	9,907	9,821	10,339
Total	18,026	17,994	17,233	16,863	17,100
Balance	5,514	9,009	12,101	14,705	17,598
Debt Service - Commission Debt					
Interest	960	2,395	3,878	5,153	6,186
Redemptions	502	1,281	2,128	2,914	3,617
Total	1,462	3,676	6,006	8,067	9,803
Available for Debt Reserve Fund, Construction, etc.	$ 4,052	$ 5,333	$ 6,095	$ 6,638	$ 7,795

PROPERTY TAXES

Regarding Ad Valorem Taxes

An argument could be made that requiring a public authority to pay property taxes to local political units is simply a transferal of money from one pocket to another and does nothing but artificially inflate the revenue and expense budgets of both.

We disagree on the following grounds: (a) Being forced to pay ad valorem taxes will help coerce the sanitary utility into behaving more along the lines of a cost-conscious private utility. It will be penalized for building structures more costly or extensive than immediately needed and for holding real estate in excess of foreseeable needs. When a choice between otherwise equally useful investment placed in a high or low tax area or a choice between high or low cost land is to be made, this cost factor would help channel the investment decision into the more economic alternative from the short-range point of view which would benefit both rate payers and the local tax payers. The tendency to plow ahead and condemn prime ratable property will be discouraged, but would, if still followed, not prove a financial blow to the governing body. (b) Since the utility's revenues will come from customers getting a service, a measurable commodity for their payment, a certain burden of governmental cost will be shifted from tax payers to these service-receiving customers. (c) Political and public resistance to utility investment in their area will be lessened when it is realized that this investment, necessary in any event, will be a tax-paying one. (d) Those areas such as the City of Baltimore, which have a tremendous investment in public assets and a static or declining tax base will realize a slowing of this erosion.

Will this drive the cost of water and sewer services up too high? It requires great economic (or perhaps philosophic) insight to determine the point of "too" high. Certainly such a move as requiring a publicly owned body to pay

property taxes will remove one of the cost advantages a public utility has over an investor-owned utility. But these two utility concepts are not competing here; there is either one or the other. In all fields of endeavor taxes are a cost of doing business. Region-wide, as in Anne Arundel County, we feel that this cost should be recognized and met by the general customer.

We tend toward the growing opinion that over the years water and sewer services have been underpriced. Replacement of obsolete and depreciated facilities and the provision of new facilities have not been at all times provided for by regular routine charges. If charges are equitably and uniformly set, and if waste and inefficiency are not present in utility operations, essential sanitary services cannot by definition be priced too high. There is no alternative service in an urban area.

Two interesting comments on this point may be gleaned from an article in "Fortune" magazine of March, 1965, reporting the proceedings of a conference on urban tax problems sponsored by the Lincoln School of Finance, the National League of Cities, The Urban Land Institute and Time, Inc.:

> "Most of us think some cities might wisely collect more revenue - in some cases a substantial revenue - from more adequate service charges for what are in effect publicly owned utilities: water supply, sewage disposal, garbage collection, parking space on and off the streets, etc."
>
> "In addition, cities might greatly benefit by making direct charges for many municipal services. Just because a utility service like water supply, garbage collection, or sewage disposal is provided by the city instead of a private utility does not necessarily mean the service must be offered free or at a loss."

Effect of Property Tax Provision

Statements 18 through 21 following this section present an estimate of what the net effect on each political body would be during the five-year period 1965-66 through 1967-70 under the recommended ad valorem tax compensation provision. In these Statements the individual County tax rates were estimated, rather than using one single overall rate, since this seemed a step closer to reality. The following assumptions were also made:

(a) Tax rates are effective rates on 100% value.

(b) Valuations are at cost.

(c) 15% of the Susquehanna Aqueduct is in Baltimore County.

(d) 85% of the Aqueduct is in Harford County.

(e) 6.5% of the City's reservoir land value is in Carroll County.

(f) Debt is retired uniformly in each locale.

These assumptions and computations are presented in detail so that at any time more refined or later data may be substituted and the calculations reworked by anyone interested.

Another assumption, and one that proves to be decisive in determining the flow of tax payments from one body to another, is that new Commission plant is taxable as well as pre-existing plant over and above outstanding debt. Statement 20 summarizes the taxable plant in each locality, the effective tax rates and the taxes received by each body.

In our opinion the mere shifting of some of the local property tax burden away from property owners and onto commodity rate payers is sufficient to provide the compensation required. But it can be said that the fairness of the arrangement cannot be weighed unless the source of the tax payments is also estimated and the net in and out flow determined. However, in estimating the source

of revenues in the service area of the Central Maryland Sanitary Commission we run head on into a situation where it is obvious that at best only a very rough estimate can be made, for the simple reason that no rate structure for the Commission exists and even its basic form is uncertain. (Elsewhere we recommend as uniform a rate as possible but only after a careful cost-of-service study.) It may be safely said that in a given set of consumer circumstances, rates can be designed to give the results desired.

On Statement 20 we have also estimated area payments on a per-customer basis. This is as reasonable a quick estimate as any and is in line with our previous analysis of partial mergers.

It is at once apparent that as a means of equitable long-range compensation to the present owners of the majority of the region's facilities, the City of Baltimore, this system in total does not give the desired result, if "equity" must be defined as a net inflow of tax payments. So much more future utility plant is being added in the suburban areas that they give evidence of rapidly catching up to and outdistancing the City in value of taxable plant.

Statement 21 summarizes the same calculations with the single change that newly-added Commission plant is not taxable, but only plant existing at the time of merger. This variation results in more nearly the balance wanted, for the City, but Anne Arundel County and Baltimore County seem to be getting little reimbursement for their existing plant and is paying instead for future source of supply.

Further modifications of this same basic procedure are possible:

(a) The total payments to be made may be limited to the total gross value of the old plant, ceasing when the total is reached.

(b) Plant under one ownership but located in another area may be either taxed as if in the owning jurisdiction, or may be completely omitted from all taxation.

(c) Local tax rates may be omitted and a uniform percentage payment used.

It must be recognized that these assumptions and calculations can do nothing more than provide an indication of the magnitude of the yearly figures. There is no precision here. The mere assumption of taxing at original cost cannot be justified, but figures of depreciated plant value do not exist to permit an approximation of true present worth.

The point to keep in focus is that this is merely one scheme for paying for plant value over and above that compensated for by assuming outstanding debt; its own merits and defects have no connection whatever with the merits and defects of the formation of the Commission. It need not be done via taxation; the same result can be had by agreement. We feel that it does offer the following advantages:

1. It adds badly needed tax base to the eroding urban area.
2. It stands in lieu of a franchise, compensating local government for use of its thoroughfares and for its public services.
3. It does not conflict with but complements recent studies on state taxation problems.
4. It is in line with Anne Arundel County's charter provision requiring publicly-owned utilities to pay full ad valorem taxes.

We are confident that if such a means of compensation is chosen, any real inequities can be successfully negotiated by the assembled representatives of the local governments.

CENTRAL MARYLAND SANITARY COMMISSION

COMPUTATION OF ESTIMATED AD VALOREM TAXES

	1964-65	1965-66	1966-67	1967-68	1968-69	1969-70
City of Baltimore						
Gross Plant	$317,508	$317,508	$317,508	$317,508	$317,508	$317,508
Deduct Susquehanna Aqueduct	(33,988)	(33,988)	(33,988)	(33,988)	(33,988)	(33,988)
Deduct Reservoirs	(69,239)	(69,239)	(69,239)	(69,239)	(69,239)	(69,239)
Deduct Back River Plant	(19,774)	(19,774)	(19,774)	(19,774)	(19,774)	(19,774)
Net Plant	194,507	194,507	194,507	194,507	194,507	194,507
Deduct Own Debt	(82,425)	(78,872)	(75,197)	(71,685)	(68,215)	(64,559)
Add New Plant (Cumulative)	-	3,226	14,396	25,525	34,236	42,560
Total Taxable Plant in City	$112,082	$118,861	$133,706	$148,347	$160,528	$172,508
Baltimore County						
Gross Plant	$107,902	$107,902	$107,902	$107,902	$107,902	$107,902
Add Susquehanna Aqueduct (15%)	5,098	5,098	5,098	5,098	5,098	5,098
Add Reservoirs (93.5%)	64,739	64,739	64,739	64,739	64,739	64,739
Add Back River Plant (100%)	19,774	19,774	19,774	19,774	19,774	19,774
Net Plant	197,513	197,513	197,513	197,513	197,513	197,513
Deduct Own Debt	(85,835)	(82,136)	(78,308)	(74,651)	(71,038)	(67,230)
Deduct Transferred Debt	(37,972)	(36,335)	(34,642)	(33,024)	(31,426)	(29,742)
Add New Plant (Cumulative)	-	10,174	23,304	34,809	48,113	59,372
Total Taxable Plant in County	$ 73,706	$ 89,216	$107,867	$124,647	$143,162	$159,913
Harford County						
Gross Plant	$ 4,155	$ 4,155	$ 4,155	$ 4,155	$ 4,155	$ 4,155
Add Susquehanna Aqueduct (85%)	28,890	28,890	28,890	28,890	28,890	28,890
Net Plant	33,045	33,045	33,045	33,045	33,045	33,045
Deduct Own Debt	(1,579)	(1,511)	(1,441)	(1,374)	(1,307)	(1,237)
Deduct Transferred Debt	(12,244)	(11,716)	(11,170)	(10,648)	(10,133)	(9,590)
Add New Plant (Cumulative)	-	1,390	4,380	5,670	6,760	8,150
Total Taxable Plant in County	$ 19,222	$ 21,208	$ 24,814	$ 26,693	$ 28,365	$ 30,368
Carroll County						
Gross Plant	$ 2,200	$ 2,200	$ 2,200	$ 2,200	$ 2,200	$ 2,200
Add Reservoirs (6.5%)	4,500	4,500	4,500	4,500	4,500	4,500
Net Plant	6,700	6,700	6,700	6,700	6,700	6,700
Deduct Own Debt	(1,363)	(1,304)	(1,243)	(1,185)	(1,128)	(1,068)
Deduct Transferred Debt	(1,908)	(1,826)	(1,741)	(1,660)	(1,580)	(1,495)
Add New Plant (Cumulative)	-	10	750	3,256	5,850	8,847
Total Taxable Plant in County	$ 3,429	$ 3,580	$ 4,466	$ 7,111	$ 9,842	$ 12,984

Statement 19

CENTRAL MARYLAND SANITARY COMMISSION

COMPUTATION OF ESTIMATED AD VALOREM TAXES

	1964-65	1965-66	1966-67	1967-68	1968-69	1969-70
Howard County						
Gross Plant	$ 4,849	$ 4,849	$ 4,849	$ 4,849	$ 4,849	$ 4,849
Deduct Own Debt	(4,987)	(4,772)	(4,550)	(4,338)	(4,128)	(3,907)
Add New Plant (Cumulative)	-	3,470	5,500	8,790	12,730	16,710
Total Taxable Plant in County	-	$ 3,547	$ 5,799	$ 9,301	$ 13,451	$ 17,652
Anne Arundel County						
Gross Plant	$ 34,957	$ 34,957	$ 34,957	$ 34,957	$ 34,957	$ 34,957
Deduct Own Debt	(27,398)	(26,217)	(24,995)	(23,828)	(22,675)	(21,460)
Add New Plant (Cumulative)	-	8,362	21,214	37,054	48,635	56,853
Total Taxable Plant in County	$ 7,559	$ 17,102	$ 31,176	$ 48,183	$ 60,917	$ 70,350
Total Gross Plant	$471,571	$471,571	$471,571	$471,571	$471,571	$471,571
Total Debt	(255,711)	(244,689)	(233,287)	(222,393)	(211,630)	(200,288)
Total New Plant	-	26,622	69,544	115,104	156,324	192,492
Total Taxable Plant	$215,998	$253,504	$307,828	$364,282	$416,265	$463,775

CENTRAL MARYLAND SANITARY COMMISSION

COMPUTATION OF ESTIMATED AD VALOREM TAXES

	1964-65	1965-66	1966-67	1967-68	1968-69	1969-70	Annual Percent Increase
Taxable Plant by Location							
City of Baltimore	$112,082	$118,861	$133,706	$148,347	$160,528	$172,508	
Baltimore County	73,706	89,216	107,867	124,647	143,162	159,913	
Harford County	19,222	21,208	24,814	26,693	28,365	30,368	
Carroll County	3,429	3,580	4,466	12,111	14,842	17,984	
Howard County	-	3,547	5,799	9,301	13,451	17,652	
Anne Arundel County	7,559	17,102	31,176	48,183	60,917	70,350	
Effective Tax Rates							
City of Baltimore		2.70	2.84	2.98	3.13	3.29	5.0%
Baltimore County		1.72	1.82	1.93	2.05	2.17	6.0%
Harford County		1.01	1.04	1.07	1.10	1.13	3.0%
Carroll County		1.20	1.26	1.32	1.39	1.46	5.0%
Howard County		1.18	1.25	1.32	1.40	1.48	6.0%
Anne Arundel County		1.46	1.55	1.65	1.76	1.87	6.5%
Taxes Received by Area							
City of Baltimore		$ 3,026	$ 3,376	$ 3,984	$ 4,643	$ 5,281	
Baltimore County		1,268	1,624	2,082	2,555	3,107	
Harford County		194	221	266	294	321	
Carroll County		41	45	59	168	217	
Howard County		-	44	77	130	199	
Anne Arundel County		110	265	514	848	1,139	
Total		$ 4,639	$ 5,575	$ 6,982	$ 8,638	$ 10,264	
Taxes Paid by Area*							
City of Baltimore		$ 2,581	$ 3,040	$ 3,748	$ 4,535	$ 5,291	
Baltimore County		1,463	1,800	2,284	2,890	3,481	
Harford County		97	123	157	200	246	
Carroll County		53	63	82	103	125	
Howard County		43	57	77	101	128	
Anne Arundel County		402	492	634	809	993	
Total		$ 4,639	$ 5,575	$ 6,982	$ 8,638	$ 10,264	
Net Gain or (Loss) by Area							
City of Baltimore		$ 445	$ 336	$ 236	$ 108	$ (10)	
Baltimore County		(195)	(176)	(202)	(335)	(374)	
Harford County		97	98	109	94	75	
Carroll County		(12)	(18)	(23)	65	92	
Howard County		(43)	(13)	-0-	29	71	
Anne Arundel County		(292)	(227)	(120)	39	146	
Total		-0-	-0-	-0-	-0-	-0-	

* Per customer basis.

Statement 21

CENTRAL MARYLAND SANITARY COMMISSION
COMPUTATION OF ESTIMATED AD VALOREM TAXES
(NEW PLANT NON-TAXABLE)

	1964-65	1965-66	1966-67	1967-68	1968-69	1969-70	Future*
Taxable Plant							
City of Baltimore	$112,082	$115,635	$119,310	$122,822	$126,292	$129,948	$194,507
Baltimore County	73,706	79,042	84,563	89,838	95,049	100,541	197,513
Harford County	19,222	19,818	20,434	21,023	21,605	22,218	33,045
Carroll County	3,429	3,570	3,716	3,855	3,992	4,137	6,700
Howard County	-	77	299	511	721	942	4,849
Anne Arundel County	7,559	8,740	9,962	11,129	12,282	13,497	34,957
Taxes Received by Area							
City of Baltimore		$ 3,026	$ 3,284	$ 3,555	$ 3,844	$ 4,155	$ 6,399
Baltimore County		1,268	1,439	1,632	1,842	2,063	4,286
Harford County		194	206	219	231	244	373
Carroll County		41	45	49	54	58	98
Howard County		-	1	4	7	11	72
Anne Arundel County		110	135	164	196	230	656
Total		$ 4,639	$ 5,110	$ 5,623	$ 6,174	$ 6,761	$ 11,884
Taxes Paid by Area							
City of Baltimore		$ 2,581	$ 2,786	$ 3,019	$ 3,242	$ 3,485	
Baltimore County		1,463	1,651	1,840	2,065	2,293	
Harford County		97	113	126	143	162	
Carroll County		53	58	66	74	83	
Howard County		43	51	62	72	84	
Anne Arundel County		402	451	510	578	654	
Total		$ 4,639	$ 5,110	$ 5,623	$ 6,174	$ 6,761	
Net Gain or (Loss) by Area							
City of Baltimore		$ 445	$ 498	$ 536	$ 602	$ 670	
Baltimore County		(195)	(212)	(208)	(223)	(230)	
Harford County		97	93	93	88	82	
Carroll County		(12)	(13)	(17)	(20)	(25)	
Howard County		(43)	(50)	(58)	(65)	(73)	
Anne Arundel County		(292)	(316)	(346)	(382)	(424)	
Total		$ -0-	$ -0-	$ -0-	$ -0-	$ -0-	

* After existing debt is retired, assuming 1969-70 tax rates - any year

APPENDIX A

A SYNOPSIS OF WATER-SEWER FACILITIES PLANNING REQUIREMENTS OF DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

The following quote from the planning requirements guide provides a summary of the new requirements:

> "Eligibility for assistance requires a showing that the individual water or sewer project is or will be consistent with the short-range, areawide program which, in turn, is adequately related to long-range areawide planning. This requires links between the individual project, the areawide system of water or sewer facilities, and the overall development of the urban area. In developing this relationship, the key elements are that:
>
> 1. the project is consistent with a short-range, areawide water or sewer system program;
> 2. the areawide program is based on long-range, areawide water and sewer planning;
> 3. water and sewer planning is part of long-range, areawide comprehensive planning; and
> 4. comprehensive planning is conceived and carried out to attain urban area goals and objectives under the policy direction of local elected officials."

In the preceding context "short-range" can be taken to mean five to ten years, while "long-range" can be taken to mean twenty years as a minimum.

Prior to the effective date of July 1, 1968 a set of interim planning requirements will be in force as quoted below:

> "A. Comprehensive Planning
> Comprehensive planning shall be underway. A planning agency shall have been established. While no fully prepared plan elements are required, there shall exist a schedule of planning activities that demonstrates that the regular planning requirements will be met within a reasonable period.
>
> B. Water and Sewer Planning
> Water and sewer planning shall be underway, and there shall exist a schedule of water and sewer planning activities that demonstrates that the regular planning requirements will be met within a reasonable period.
>
> C. Water and Sewer Facilities Programming Coordination
> 1. The water or sewer facilities system program shall be under active preparation, and there shall exist a schedule of activities that demonstrates that the program will be completed within a reasonable period.

2. A sufficient basis shall exist for determining that the proposed facility or facilities can be reasonably be expected to be part of the program.

3. There shall be initiated suitable arrangements or procedures for continuing relationships and the coordination of activities.

D. Project Review

1. Planning Review. Prior to submission of an application for a water or sewer facilities grant, the applicant shall have the proposed project reviewed and commented on by the agency or agencies responsible for the planning and programming described in this guide. If the agency or agencies do not review and comment on the proposal within 30 days, the applicant may proceed with the submission of the application for assistance without such review and comment.

Additional reviews as appropriate, at the local, regional or state level may be required by HUD.

2. Other Notifications. In addition, the applicant should notify other appropriate governmental agencies of its proposed application, and request their comments on the proposal, particularly as it related to the plans and programs of such agencies. Such agencies may be state, regional metropolitan, county municipal or other governmental agencies concerned with comprehensive planning, water and sewer planning, and provision of water or sewer facilities and services."

In the above context the "planning agency" is the Regional Planning Council, which agency is already required to review and approve such capital grant applications.